MEDICAL PROCEEDINGS

MEDIESE BYDRAES

A South African Journal for the Advancement of Medical Science

'n Suid-Afrikaanse Tydskrif vir die Bevordering van die Geneeskunde

P.O. Box 1010 · Johannesburg | Posbus 1010 · Johannesburg

Vol. 4 | 1 November 1958 | No. 22

EDITORIAL · REDAKSIONEEL

IMPORTANT DECISIONS OF THE SOUTH AFRICAN MEDICAL COUNCIL AT ITS MEETING IN SEPTEMBER 1958

The Advertisement of Professional Appointments

At the 67th meeting of the Medical Council several matters of vital importance to the profession were discussed. Foremost among these was the fate of ethical rules 19 and 19 (*bis*). These rules relate to the advertisement of professional appointments in the medical and the lay press. Dr. J. N. W. Loubser proposed that rules 19 and 19 (*bis*) should be abandoned. There was very considerable and influential support for this proposition, largely on the grounds that the effect of the rules brought the Council into the sphere of the economics of medical practice (a dubious function of the Council) and did not touch on any fundamental principle of ethics (the concern of which is the purpose of the ethical rules). Dr. Maurice Shapiro emphasized that while he agreed completely that rules 19 and 19 (*bis*) did not deal fundamentally with any ethical principle and that the operation of such rules was essentially the function of the organized profession, to abandon the rules at the present stage and before the Medical Association was in a position to ensure the necessary discipline, would be to invite chaos in professional appointments. It was imperative that these rules (as amended by the special *ad hoc* Committee) should meanwhile be kept within the powers of the Council.

Dr. Loubser's proposal received strong opposition as well as strong support. His

BELANGRIKE BESLUITE VAN DIE SUID-AFRIKAANSE GENEESKUNDIGE RAAD OP SY VERGADERING IN SEPTEMBER 1958

Die Adverteer van Professionele Aanstellings

Etlike sake wat van die allergrootste belang vir die professie is, is op die 67ste vergadering van die Geneeskundige Raad bespreek. Die belangrikste hiervan was die lot van etiese reëls 19 en 19 (*bis*). Hierdie reëls het betrekking op die adverteer van professionele aanstellings in die mediese en die leke-pers. Dr. J. N. W. Loubser het voorgestel dat reëls 19 en 19 (*bis*) afgeskaf moet word. Daar was aansienlike en invloedryke steun vir hierdie voorstel, grotendeels op grond daarvan dat hierdie reëls die Raad in die ekonomiese sfeer van die mediese praktyk plaas ('n twyfelagtige funksie vir die Raad), en dat hulle geen fundamentele etiese beginsels raak soos 'n etiese reël behoort te doen nie. Dr. Maurice Shapiro het beklemtoon dat hy volkome daarmee eens is dat reëls 19 en 19 (*bis*) fundamenteel geen etiese beginsels raak nie, en dat die toepassing van daardie reëls in sy wese 'n funksie is wat by die georganiseerde professie tuishoort. Nogtans meen hy dat as die betrokke reëls op die huidige tydstip geskrap word, voordat die Mediese Vereniging 'n kans gehad het om die nodige dissipline te verseker, dit net op chaos in professionele aanstellings sal uitloop. Dit is dringend noodsaaklik dat hierdie reëls (soos gewysig deur die spesiale *ad hoc*-komitee) intussen binne die bevoegdheid van die Raad moet bly.

Dr. Loubser se voorstel het sterk teëstand sowel as sterk steun ontvang. Sy teëstanders

opponents were of the view that ethical principles of conduct were involved. The debate was resolved by a sensible decision to temporize. The principles underlying rules 19 and 19 (*bis*) were referred back to the Executive Committee of the Council for reconsideration and for an opportunity to hear the views of the Medical Association on the proposal to abolish these rules at some future date. The dental members of the Council were largely content with the existing rules, with the result that the Executive Committee was not required to have consultations with the Dental Association. University representatives were mostly in support of the elimination of rule 19 (*bis*) as they felt it interfered with the prerogative (and tradition) of academic institutions to invite eminent scholars to accept appointments.

Whatever the ultimate fate of the ethical rules requiring the advertisement of professional appointments may be, the Council proceeded with the amendment of these rules as recommended by a special *ad hoc* Committee. Rules 19 and 19 (*bis*), as amended, and as they affect medical practitioners, are published elsewhere in this issue.

Even if the Council eventually decides that these rules must be abandoned because their scope does not fall within the ethical ambit of the Council's duties, it appears to us that it would be desirable to retain powers for the Council to compel disclosure of the conditions of employment, if a complaint is brought to the Council. If this power is preserved, the ethical rule preventing a practitioner from permitting himself to be exploited in a manner detrimental to the public or the professional interest, would gain substantial force and become truly effective.

The power of scrutiny would, however, not prevent nepotism in professional appointments; but, in any event, it is extremely doubtful whether the existing rules do so, or whether any rule, for that matter, could ever do so.

RULE 19 (*ter*). PROFESSIONAL APPOINTMENTS TO BODIES, SOCIETIES OR ORGANIZATIONS PROVIDING MEDICAL SERVICES

It is really for the convenience of the numbering of the Council's ethical rules that this new rule is identified as 19 (*ter*). It is a distinct rule which is not related to the principles involved in the advertisement of professional appointments.

The rule (as adopted by the Council) reads:

'1. A medical practitioner or a dentist who has accepted a professional appointment to any Body,

was die mening toegedaan dat etiese gedragsbeginsels wel by die saak betrokke is. Die debat is beëindig deur 'n verstandige besluit, nl. om die saak uit te stel. Die beginsels wat ten grondslag van reëls 19 en 19 (*bis*) lê, is na die Uitvoerende Komitee van die Raad terugverwys vir heroorweging, en vir die aanhoor van die sienswyses van die Mediese Vereniging oor die voorstel dat die reëls op die een of ander tydstip in die toekoms afgeskaf moet word. Oor die algemeen was die tandheelkundige lede van die Raad heeltemal tevrede met die bestaande reëls, met die gevolg dat die Uitvoerende Komitee dit nie nodig gevind het om oorleg met die Tandheelkundige Vereniging te pleeg nie. Die universiteitsverteenwoordigers was meestal ten gunste van die skrapping van reël 19 (*bis*), want, volgens hul mening, doen dit inbreuk op die prerogatief (en tradisie) van akademiese inrigtings om vooraanstaande geleerdes uit te nooi om aanstellings te aanvaar.

Wat ook al die uiteindelike lot gaan wees van die etiese reëls wat die adverteer van professionele aanstellings noodsaaklik maak, het die Raad toe oorgegaan tot die wysiging van hierdie reëls in ooreenstemming met die aanbevelings van die spesiale *ad hoc*-komitee. Reëls 19 en 19 (*bis*) soos gewysig, en in soverre hulle mediese praktisyns raak, word elders in hierdie uitgawe gepubliseer.

Selfs al besluit die Raad ook uiteindelik om hierdie reëls te skrap omdat hul bestek nie binne die etiese grense van die Raad se pligte val nie, skyn dit vir ons asof dit wenslik vir die Raad sal wees om die bevoegdheid te behou om aan te dring op die openbaarmaking van indiensnemingsvoorwaardes indien 'n klagte onder die aandag van die Raad gebring word. Indien hierdie bevoegdheid behou word, sal die etiese reël wat 'n mediese praktisyn verbied om hom te laat uitbuit op 'n manier wat nadelig vir die publiek of vir professionele belange is, aansienlik versterk en inderdaad werklik doeltreffend gemaak word.

Die reg om noukeurige ondersoek in te stel, sal weliswaar nie nepotisme in professionele aanstellings uitskakel nie; maar in elk geval is dit baie twyfelagtig of die huidige reëls daarin slaag, of indien enige reël, wat dit betref, dit ooit sal kan doen.

REËL 19 (*ter*). PROFESSIONELE AANSTELLINGS TOT LIGGAME, VERENIGINGS OF ORGANISASIES WAT MEDIESE DIENSTE BESKIKBAAR STEL

Die eintlike rede waarom hierdie nuwe reël as 19 (*ter*) geïdentifiseer word, is om dit

Society or Organization providing medical or dental services, may be required to answer to the Council for any act or omission in providing such services or for any act performed by or on behalf of such Body, Society or Organization, which may appear to the Council to be such as would, if occurring in ordinary medical or dental practice, constitute improper or disgraceful conduct.'

This represents a profoundly important principle first advocated in the Council by Dr. M. Shapiro several years ago. As a result the Council adopted the principle involved and now seeks to implement the matter. The rule has the effect of bringing medical practitioners employed by lay organizations (and hence, in effect, the organizations themselves) squarely within the scope of the Council's ethical rules. As it was not quite clear whether rule 19 (*ter*) (in the form in which it was approved by the Council) was *intra vires* the powers given by the Medical, Dental and Pharmacy Act, it was decided to seek legal opinion on this point.

If the opinion is to the effect that the proposed rule is *intra vires* the Act, it will be promulgated. If it is *ultra vires* the Act, the necessary enabling amendment to the principal Act will be sought.

RULE 19 (*Quat*). PROFESSIONAL APPOINTMENTS—TEMPORARY APPOINTMENTS, TRANSFERS AND PROMOTIONS

This rule, as considered by the Council, reads:

'1 (*a*) For the purpose of Rules 19 and 19 (*bis*), the temporary appointment of a medical practitioner or a dentist as a *locum tenens* for a period not exceeding 6 months shall not be deemed to be a professional appointment;

(*b*) for the purpose of Rule 19 (*bis*) transfers or promotions within a service will not be regarded as new appointments and such posts need not be readvertised.'

In view of the legitimate interest of the profession in ensuring that appointments to public hospitals should be advertised, the rule was deferred for further discussion with the Medical Association.

COMPULSORY TRAINING OF INTERNS IN ANAESTHETICS

As we have pointed out in a recent Editorial,* training of interns in anaesthetics leaves much to be desired. We therefore welcome and endorse the Council's decision to insist on compulsory training of interns in anaesthesia. The criteria for the training of interns will now embody the following:

* This Journal, 23 August 1958, p. 571.

gerieflliker te maak om al die Raad se etiese reëls 'n nommer te gee. Dit is 'n heeltemal afsonderlike reël wat nie in verband staan met die beginsels wat by die adverteer van professionele aanstellings betrokke is nie.

Die reël (soos deur die Raad aanvaar) lui soos volg:

‚1. Van 'n mediese praktisyn of 'n tandarts wat 'n professionele aanstelling aanvaar tot enige Liggaam, Vereniging of Organisasie wat mediese of tandheelkundige dienste beskikbaar stel, kan daar verlang word om verantwoording aan die Raad te doen van enige daad of versuim by die verskaffing van sodanige dienste, of van enige daad verrig deur of namens sodanige Liggaam, Vereniging of Organisasie wat, as dit in 'n gewone mediese of tandheelkundige praktyk verrig was, volgens die mening van die Raad op onbehoorlike of laakbare gedrag sou neerkom.'

Dit verteenwoordig 'n hoogs belangrike beginsel wat etlike jare gelede vir die eerste keer deur dr. M. Shapiro in die Raad bepleit is. Ten gevolge daarvan het die Raad die onderhawige beginsel aanvaar, en streef hy nou om uitvoering daaraan te gee. Die effek van hierdie reël is om mediese praktisyns wat in diens van leke-organisasies staan (en gevolglik ook die organisasies self) vierkantig binne die bestek van die Raad se etiese reëls te bring. Aangesien dit nie heeltemal duidelik was of reël 19 (*ter*) (in die vorm waarin dit deur die Raad goedgekeur is) *intra vires* die bevoegdhede soos verleen deur die Wet op Geneeshere, Tandartse en Aptekers is nie, is daar besluit om 'n regsmening oor hierdie aangeleentheid in te win.

As die mening is dat die voorgestelde reël *intra vires* die Wet is, sal dit afgekondig word. As dit *ultra vires* die Wet is, sal 'n poging aangewend word om die nodige bevoegdheidgewende wysigings in die hoofwet aan te bring.

REËL 19 (*Quat.*). PROFESSIONELE AANSTELLINGS—TYDELIKE AANSTELLINGS, VERPLASINGS EN BEVORDERINGS

Hierdie reël, soos deur die Raad oorweeg, lui soos volg:

‚1. (*a*) Vir die doeleindes van Reëls 19 en 19 (*bis*) word die tydelike aanstelling van 'n mediese praktisyn of 'n tandarts as 'n *locum tenens* vir 'n tydperk van hoogstens ses maande nie as 'n professionele aanstelling beskou nie.

(*b*) Vir die doeleindes van Reël 19 (*bis*) word verplasings of bevorderings binne 'n diens nie as nuwe aanstellings beskou nie, en sodanige betrekkings hoef nie geadverteer te word nie.'

Met die oog op die professie se gewettigde strewe om te verseker dat aanstellings in openbare hospitale geadverteer moet word, is daar besluit om hierdie reël verder met die Mediese Vereniging te bespreek.

'In the surgical and obstetrical and gynaecological wards the intern should be taught to recognize emergencies.

While it is desirable that he assist at operations, it is not desirable that he himself should undertake major operations.

He should be taught the principles of pre- and post-operative care, be given every opportunity to learn minor surgery *and must personally administer at least 50 general anaesthetics.*'

The introduction of the compulsory administration of 50 general anaesthetics by an intern is a compromise. Medical Schools can improve on the minimum requirements now demanded by the Council. At the University of Pretoria, for example, as Prof. H. W. Snyman pointed out, a system of rotating internships permits each intern to spend a month doing anaesthetics.

The Council's progressive step in ensuring that interns are fully trained in this field will be commended throughout the profession. It is important for authorities employing interns to appreciate that the intern year is essentially an extension of the 6-year curriculum during which the fledgling doctor has an opportunity for a progressive but graduated assumption of responsibility and of acquiring experience in those techniques essential for general practice. He is not in any sense primarily employed to relieve the rest of the professional staff of their duties, if this is to be at the expense of the final stages of his training.

AN ALLEGATION THAT CERTAIN REGULATIONS OF THE S.A.R. AND H. FUND ARE DEROGATORY TO GENERAL PRACTICE AND CONTRARY TO THE COUNCIL'S ETHICAL STANDARDS

The Council received a very fully documented allegation from a registered medical practitioner to the effect that certain regulations of the S.A.R. & H. Sick Fund are not in the best interest of beneficiary patients, are derogatory to general practice and contrary to the Council's ethical standards. It was pointed out in debate that one of the alarming conditions under which medical practitioners are required to carry out their professional duties, is contained in the following instruction from the Sick Fund, dated 15 March 1957, when a supplement to the S.A.R. and H. Sick Fund Formulary was issued through a District Secretary. In this directive it was stated that the lists of drugs, etc. permitted are considered adequate for the treatment of all human ailments and that

'with the exception of those categories appearing in sub-section 5 (9) on page 51, for the supply of which the Sick Fund cannot be regarded as responsible, *a railway medical officer must under no cir-*

VERPLIGTE OPLEIDING VAN INTERNS IN DIE NARKOSELEER

In 'n onlangse inleidingsartikel* het ons daarop gewys dat die opleiding van interns in die narkoseleer veel te wense oorlaat. Ons verwelkom en beaam derhalwe die Raad se besluit om aan te dring op die verpligte opleiding van interns in die verdowingsleer. Die maatstawwe vir die opleiding van interns sal voortaan die volgende behels:

In die chirurgiese en verloskundige en ginekologiese sale sal die intern geleer word om noodgevalle te herken.

Terwyl dit wenslik is dat hy met operasies moet help, is dit nie wenslik dat hy self groot operasies moet onderneem nie.

Hy moet opgelei word in die beginsels van voor- en na-operasie-versorging, hy moet alle moontlike geleenthede gebied word om ondervinding van kleiner operasies op te doen, *en hy moet persoonlik ten minste* 50 *algemene narkoses toedien.*

Die bepaling dat 'n intern voortaan verplig sal wees om 50 algemene narkoses toe te dien, is 'n kompromis. Mediese skole kan verbeter op die minimum-vereistes soos tans deur die Raad neergelê. By die Universiteit van Pretoria, soos prof H. W. Snyman byvoorbeeld daarop gewys het, is daar 'n stelsel van wisselende internskappe wat iedere intern in staat stel om 'n maand lank narkosewerk te doen.

Die Raad se vooruitstrewende stap om te verseker dat interns volledige opleiding op hierdie gebied ontvang, sal byval dwarsdeur die professie vind. Vir besture wat interns in diens neem, is dit van belang om te besef dat die jaar van internskap in sy wese 'n verlenging van die 6-jaar-leerplan is, en dat die jong dokter in die loop daarvan 'n geleentheid gebied moet word vir die progressiewe maar gegradeerde aanvaarding van verantwoordelikheid en die verwerwing van die vernuf wat noodsaaklik vir die algemene praktyk is. Die eerste en vernaamste doel van sy indiensneming is geensins om die res van die professionele personeel van pligte te onthef—as dit geskied ten koste van die finale stadium van sy opleiding nie.

'N BEWERING DAT SEKERE REGULASIES VAN DIE S.A.S. & H.-FONDS KLEINEREND VIR DIE ALGEMENE PRAKTYK EN IN STRYD MET DIE RAAD SE ETIESE MAATSTAWWE IS

'n Volledig gedokumenteerde bewering van 'n geregistreerde mediese praktisyn ten effekte dat sekere regulasies van die S.A.S. & H.-fonds nie in die beste belang van bevoordeelde pasiënte is nie, en dat hulle kleinerend vir die algemene praktyk en in stryd met die Raad se etiese maatstawwe is, is deur die Raad in oorweging geneem. In die loop van die debat is daarop gewys dat een van die onrusbarende voorwaardes waaronder mediese praktisyns verwag word om hul professionele pligte na te kom, vervat is in die volgende opdrag van die Siektefonds, gedagteken 13 Maart 1957, toe 'n toevoegsel tot die S.A.S. & H. se Siektefondsformulier deur 'n Distriksekretaris uitgereik is. In hierdie opdrag word daar verklaar dat die geoorloofde lys van geneesmiddels, ens., voldoende vir die behandeling van alle menslike kwale geag word, en dat

‚met die uitsondering van dié klasse wat in onderartikel 5 (9) op bladsy 51 genoem word, vir die

* Hierdie Tydskrif, 23 Augustus 1958, bl. 571.

cumstances suggest, advise or request the purchase of a drug or preparation by a beneficiary. Such a procedure is contrary to a specific ruling by the Executive Committee of the Central Sick Fund Board and any contraventions of this ruling will be viewed in a serious light.'

The medical practitioner employed by this Sick Fund may thus imperil his livelihood if he tells a patient that a drug which he feels the patient needs is not on the prescribed list. He is even barred, in terms of this instruction, from telling the patient that he will prescribe the drug if the patient will pay for it himself. This is clearly an intolerable condition under which medical practitioners are required to exercise their calling.

The view was also expressed that the doctor-patient relationship was undermined and confidence destroyed by such an imposition on the doctor's professional conscience. The whole issue was referred to the Executive Committee for consideration.

RULES UNDER WHICH SPECIALISTS MAY PRACTICE

Probably a decision affecting the practice of medicine most vitally in this country was one taken by the Council towards the end of its meeting. The Council, in March 1956, after giving consideration to a report of the special *ad hoc* Committee on the registration of specialists or consultants resolved:

(*a*) That the statutory registration of specialists be maintained but that rules be drafted to place certain restrictions on the actions of specialists in an attempt to remove some of the causes of friction between specialists and general practitioners, in the interest of both these classes of medical practitioners and also of the public.

(*b*) That the principles to be adopted in drafting the rules be:

i. Specialists shall not do domiciliary visiting, except when requested to do so by a general practitioner;

ii. That if a specialist becomes cognizant of the fact that the patient has a general practitioner, it is incumbent on him to report to the general practitioner;

iii. That it is incumbent on a specialist to refer the patient to his general practitioner for treatment which is customarily administered by a general practitioner, and in this connexion the specialist must satisfy himself as to whether the patient has a general practitioner treating him; if he is satisfied that the patient is not under the treatment of a general practitioner he may continue to treat the patient himself and he may also continue to treat the patient if he is requested to do so by the general practitioner;

iv. That it shall be incumbent on a specialist to ascertain from a patient who comes to him direct whether or not the patient has a general practitioner;

v. That a general practitioner shall not prevent a patient from going to a specialist of his choice, provided he is selecting the right type of specialist.

beskikbaarstelling waarvan die Siektefonds nie verantwoordelik gehou kan word nie, *'n mediese amptenaar van die Spoorweë in geen omstandighede die aankoop van 'n geneesmiddel of preparaat deur 'n begunstigde moet suggereer, adviseer of versoek nie.* Enige sodanige prosedure is in stryd met 'n spesifieke besluit van die Uitvoerende Komitee van die Sentrale Siektefonds-raad, en enige oortreding van hierdie reël sal in 'n ernstige lig beskou word.'

'n Mediese praktisyn wat in diens van hierdie Siektefonds staan, kan dus sy hele toekoms in gevaar stel as hy aan 'n pasiënt vertel dat 'n geneesmiddel wat die pasiënt, volgens sy mening, nodig het, nie in die voorgeskrewe lys voorkom nie. Volgens die bepalings van hierdie opdrag word die dokter selfs verbied om aan die pasiënt te sê dat hy bereid is om die betrokke geneesmiddel voor te skryf indien die pasiënt gewillig is om self daarvoor te betaal. Dit is heeltemal duidelik dat dit 'n ondraaglike voorwaarde is vir die mediese praktisyn wat sy beroep behoorlik wil nakom.

Die mening is ook uitgespreek dat die dokter-pasiënt-verhouding ondermyn, en dat vertroue afgebreek sal word deur so 'n beetnemery van die geneesheer se professionele gewete. Die hele aangeleentheid is vir verdere oorweging na die Uitvoerende Komitee verwys.

REËLS WAARONDER SPESIALISTE MAG PRAKTISEER

'n Besluit wat van lewensbelang vir die geneeskundige praktyk in hierdie land kan wees, is teen die einde van die vergadering deur die Raad geneem. In Maart 1956 het die Raad, nadat hy oorweging aan 'n verslag van die spesiale *ad hoc*-komitee oor die registrasie van spesialiste en konsulterende artse verleen het, soos volg besluit:

(*a*) Dat die statutêre registrasie van spesialiste gehandhaaf word, maar dat reëls opgestel moet word om sekere beperkings op die optrede van spesialiste te plaas in 'n poging om sommige van die oorsake van wrywing tussen spesialiste en algemene praktisyns in die belang van albei hierdie soorte mediese praktisyns en ook in die belang van die publiek uit die weg te ruim.

(*b*) Dat, by die opstel van die reëls, die volgende beginsels aanvaar moet word:

i. Spesialiste moet nie huisbesoek doen behalwe wanneer hulle deur 'n algemene praktisyn gevra word om sulks te doen nie;

ii. Dat indien 'n spesialis bewus word van die feit dat 'n pasiënt 'n algemene praktisyn het, dit sy plig is om verslag aan die algemene praktisyn te doen;

iii. Dat dit die plig van 'n spesialis is om 'n pasiënt na sy algemene praktisyn te verwys vir die soort behandeling wat gewoonlik deur 'n algemene praktisyn toegepas word. In hierdie verband moet die spesialis hom tevrede stel of die pasiënt wel 'n algemene praktisyn het wat hom behandel. Indien hy tevrede is dat dat die pasiënt nie deur 'n algemene praktisyn behandel word nie, kan hy voortgaan om die pasiënt self te behandel, en hy kan ook voortgaan om die pasiënt te behandel indien hy deur die algemene praktisyn versoek word om sulks te doen.

iv. Dat dit die plig van 'n spesialis is om uit te vind van 'n pasiënt wat regstreeks na hom gekom het of so 'n pasiënt 'n algemene praktisyn het al dan nie.

The principles involved were not departed from in a further report of the *ad hoc* Committee presented at the Council's current meeting.

Dr. James Black, however, proposed that there be an exemption in respect of specialist obstetricians. He moved:

'That a Specialist Obstetrician, who has contracted to look after a woman during her pregnancy, confinement and puerperium shall have the right to pay a domiciliary visit in such a case where he considers a visit necessary for an obstetrical reason.'

This motion was rejected by the Council.

The only remaining obstruction to the promulgation of the rules enshrining the principles debated by the Council was delay in the legal formulation of these rules.

On a motion by Dr. M. Shapiro the special *ad hoc* Committee was discharged and the Executive Committee of the Council was instructed to bring the matter to finality, subject to consultation with the Council's legal advisers.

v. Dat 'n algemene praktisyn 'n pasiënt nie moet verhinder om na 'n spesialis van sy eie keuse te gaan nie, met dien verstande dat die pasiënt die regte soort spesialis gekies het.

Van die beginsels wat by die saak betrokke is, is daar nie afgewyk in 'n verdere verslag wat die *ad hoc*-komitee aan die Raad op sy jongste sitting voorgelê het nie.

Dr. James Black het egter voorgestel dat 'n uitsondering gemaak moet word in die geval van spesialis-verloskundiges. Hy het voorgestel:

‚Dat 'n Spesialis-verloskundige wat onderneem het om 'n vrou te behandel tydens haar swangerskap, bevalling en kraamtyd, die reg moet hê om in so 'n geval die pasiënt aan haar huis te besoek as hy meen dat so 'n besoek om verloskundige redes noodsaaklik is.'

Hierdie voorstel is deur die Raad verwerp.

Die enigste oorblywende struikelblok in die weg van die afkondiging van die reëls vir die vaslegging van die beginsels wat deur die Raad bespreek is, is die vertraging wat met die regsformulering van hierdie reëls gepaard gaan.

Op 'n voorstel van dr. M. Shapiro is die spesiale *ad-hoc*-komitee ontslaan, en die Uitvoerende Komitee van die Raad is gelas om die saak tot finaliteit te bring, onderhewig aan oorlegpleging met die Raad se regsadviseurs.

THE ERA OF OPEN HEART SURGERY IN SOUTH AFRICA

Two papers which we publish elsewhere in this issue by Mr. Walter Phillips and Dr. C. Barnard (from Cape Town) and Mr. David Adler and Mr. Denis Fuller (from Johannesburg), usher in a new era for heart surgery in South Africa. In both these centres several cases of open cardiotomy have now been performed successfully with pump oxygenators. The Cape Town team was, in fact, the first in the field, but the Johannesburg team followed so hard on their heels that the honours are almost even.

Several things emerge clearly from these important communications. Large teams of experts in widely separate fields are involved, and frequent practice in team-work is essential for maximum surgical success. Moreover, the nature of the surgery is such that the surgeons concerned must carry out this type of operation regularly. This not only improves technique, but is the most certain way of ensuring that the team keeps abreast of and is able to incorporate all important advances as they occur.

There may well be difficulty, in some parts of the country, in accommodating these large, very specialized Units in the ordinary teaching hospitals. If this becomes the case, those responsible for planning our hospital requirements should seriously consider the establishment of special Heart and Lung Hospitals. This would ease pressure on existing institutions, recognize the importance of this modern

DIE TYDPERK VAN OOP-HARTCHIRURGIE IN SUID-AFRIKA

Twee referate wat elders in hierdie uitgawe gepubliseer word deur mnr. Walter Phillips en dr. C. Barnard (van Kaapstad) en mnr. David Adler en mnr. Denis Fuller (van Johannesburg) lui 'n nuwe tydperk vir hartchirurgie in Suid-Afrika in. In albei sentrums is etlike gevalle van oop-kardiotomie nou met welslae met behulp van pompoksigeneerders uitgevoer. Die Kaapstadse span was weliswaar eerste in die veld, maar die Johannesburgse span was so kort op hul hakke dat die twee op amper ewe veel eer geregtig is.

Etlike dinge blyk baie duidelik uit hierdie belangrike mededelings. Groot spanne deskundiges in wyd uiteenlopende sfere is by die saak betrokke, en herhaaldelike repetisies om die spanwerk te vervolmaak, is noodsaaklik vir maksimale chirurgiese welslae. Temeer, die aard van die chirurgie is sodanig dat die betrokke chirurge hierdie soort operasie gereeld moet uitvoer. Dit sal nie alleen hul tegniek verbeter nie, maar is ook die beste manier om te verseker dat die spanne op hoogte van al die jongste vorderinge bly, en in staat is om al hierdie ontwikkelinge, namate hulle voorkom, toe te pas.

In sommige dele van die land sal dit miskien moeilik wees om hierdie groot en besonder gespesialiseerde Eenhede in die gewone onderrighospitale te huisves. As dit blyk die geval te wees, sal diegene wat verantwoordelik

advance in surgery and ensure progress in research as well as treatment.

The authorities have an inescapable and considerable duty in this regard. The diagnosis and treatment of disease in this field, and the effective furtherance of research, can only develop if we are serious about accommodating the needs of the patients who seek treatment, as well as the needs of teaching and research. Special Heart and Lung Hospitals may well be the solution to the problem, since it must be in the best interests of the patient and the profession that cardiac surgeons should have a broad basic training in chest surgery and in diagnosis. This will enable them to cope more readily with the unexpected situations that inevitably develop at operation or post-operatively.

It seems unlikely that surgeons doing this work can reasonably cope at present with more than about one case per week. The chances are, however, that there will soon be at least 3 centres doing this type of surgery in South Africa. Even if no additional centres are established, it would mean that some 150 cases could be dealt with yearly—a turnover which will soon enough catch up with any local backlog of cases.

Open heart surgery (with the aid of the pump oxygenator) is to-day largely restricted to certain types of congenital heart lesions, e.g. atrial septal defect, AV communis, ventricular septal defect, pulmonary valve stenosis, Fallot's tetralogy and congenital aortic stenosis. There is already evidence, however, that a vast new field of heart surgery is opening up in respect of acquired lesions. There is, e.g. no satisfactory closed or tactile method for dealing with mitral incompetence—a condition which may in the near future, however, be tackled with open heart surgery.

The pump oxygenator will undoubtedly lessen the indications for employing hypothermia in open cardiotomy and it is by now well established that the modern pumps permit corrective surgery under the ideal conditions of a bloodless field without the surgeon having to race against a time limit of 7–8 minutes. The pump oxygenator has other important advantages. Ventricular fibrillation (which may be a catastrophe under hypothermia) presents no undue hazard or problem when the pump oxygenator is used. This is not to suggest that hypothermia is now obsolete. Indeed, this is far from the case. Hypothermia will continue to play an important part in many cases where it can usefully as well as preferably be employed with

vir die beplanning van ons hospitaalvereistes is ernstige aandag aan die oprigting van spesiale Hart- en Longhospitale moet bestee. Dit sal die druk op die bestaande inrigtings verlig, erkenning aan die belangrigheid van hierdie moderne vordering op die gebied van die chirurgie verleen, en vooruitgang in die sfeer van navorsing sowel as behandeling verseker.

In hierdie verband rus daar 'n onontkombare en baie groot plig op die owerheid. Die diagnose en behandeling van hierdie soort kwale en die doeltreffende bevordering van navorsingswerk is alleen moontlik as ons ons met alle erns daarop toelê om te voorsien sowel in die behoeftes van pasiënte wat behandel moet word as in onderrig- en navorsingsbehoeftes. Spesiale Hart- en Longhospitale kan die probleem bes moontlik oplos, aangesien dit in die beste belang van die pasiënt en die professie is dat hartchirurge 'n breë basiese opleiding in borschirurgie en in diagnose moet kry. Dit sal hulle in staat stel om die onverwagte toestande wat so maklik tydens 'n operasie en daarna kan ontstaan, met groter gemak die hoof te bied.

Dit is onwaarskynlik dat chirurge wat hierdie soort werk doen op die oomblik meer as ongeveer een geval per week sal kan behandel. Daar bestaan egter 'n moontlikheid dat daar eerlank ten minste 3 sentrums in Suid-Afrika sal wees waar hierdie soort operasie uitgevoer sal kan word. Selfs al word geen addisionele sentrums geopen nie, beteken dit nog dat ongeveer 150 pasiënte per jaar behandel sal kan word—'n getal wat binnekort voldoende behoort te wees om enige plaaslike agterstand in te haal.

Oop-hartchirurgie (met behulp van 'n pompoksigeneerder) is vandag grootliks beperk tot sekere tipes aangebore hartletsels, bv. atriumseptum-defek, AV communis, ventrikulêre septum-defek, pulmonale klepstenose, Fallot se tetralogie, en aangebore aortastenose. Daar is egter reeds bewyse dat 'n uitgebreide nuwe veld vir hartchirurgie oopgestel kan word vir sover dit verworwe letsels betref. Daar is bv. geen bevredigende geslote of taktiele metode vir die behandeling van myterverswakking nie. Dis egter 'n toestand wat in die naaste toekoms bes moontlik met oop-hartchirurgie aangedruf sal kan word.

Die pompoksigeneerder sal die indikasies vir die toepassing van hipotermie in gevalle van oop-kardiotomie ongetwyfeld verminder, en daar is tans bo alle twyfel vasgestel dat die moderne pompe verbeteringschirurgie in die ideale omstandighede van 'n bloedlose veld moontlik maak sonder dat dit vir die chirug nodig is om 'n wedren met die tydsbeperking van 7–8 minute aan te knoop. Die pompoksigeneerder het ander belangrike voordele. Ventrikulêre

a great degree of safety as part of the operative technique.

The great success which has attended the introduction of open heart surgery in this country is a signal tribute to the extremely high standards of professional skill attained by South African practitioners. This type of heart surgery will now undoubtedly progress very rapidly in the Union and it seems to us that there are to-day very few, if any, reasons for sending patients overseas by public subscriptions for open heart surgery.

As a profession we have demonstrated our ability to maintain our position in the van of progress. Indeed, here is an occasion when the public may well take the initiative in supporting the spearhead already launched by physicians and surgeons. We need funds not only for corrective or reparative surgery, but also (and equally important) for research into the numerous causes of the great variety of heart disease that cripple our citizenry. The most appropriate, effective and enduring way this could be accomplished would be by the establishment of a South African Heart Foundation. The South African public has repeatedly shown a remarkable generosity in supporting worthy appeals. Recent events have proved that the creation of our own Heart Foundation would be an undertaking that could hardly be bettered.

fibrillasie (wat onder hipotermie op 'n ramp kan uitloop) lewer geen buitensporige gevaar of probleem op as die pompoksigeneerder gebruik word nie. Dit beteken natuurlik glad nie dat hipotermie nou ouderwets geword het nie. Trouens, dit is baie ver van die waarheid af. Hipotermie sal voortgaan om 'n belangrike rol te speel in baie gevalle waar dit met nut en met voorkeur, en met 'n groot mate van veiligheid as deel van die operasietegniek toegepas kan word.

Die groot welslae waarmee die invoering van oop-hartchirurgie in hierdie land bekroon is, is 'n treffende huldeblyk aan die buitengewoon hoë standaard van die professionele vernuf van Suid-Afrikaanse praktisyns. Hierdie tipe hartchirurgie sal ongetwyfeld baie vinnige vordering in die Unie maak, en dit skyn vir ons asof daar vandag min, indien enige redes bestaan waarom die publiek gevra moet word om geld by te dra om pasiënte vir oop-hart-operasies na die buiteland te stuur.

As 'n professie het ons bewys gelewer van ons vermoë om ons plek aan die voorpunt van vooruitgang te behou. Inderdaad het ons hier 'n geval waar die publiek die voortrou kan neem deur steun toe te sê aan die speerpunt wat reeds deur interniste en chirurge gelanseer is. Ons het fondse nodig nie alleen vir verbeterings- of herstelchirurgie nie, maar ook—en dit is van ewe groot belang—vir die navorsing van die talle oorsake van die groot verskeidenheid van hartkwale waaraan die burgers van ons land ly. Die geskikste, doeltreffendste en blywendste manier om dit te bewerkstellig, is deur die totstandbrenging van 'n Suid-Afrikaanse Hartstigting. Vir sover dit die ondersteuning van waardige beroepe betref, het die publiek van Suid-Afrika nog altyd merkwaardige vrygewigheid aan die dag gelê. Onlangse voorvalle het bewys dat die totstandbrenging van 'n eie Hartstigting 'n onderneming sal wees waarop daar beswaarlik verbeter sal kan word.

CARDIO-PULMONARY BYPASS IN CAPE TOWN

W. L. PHILLIPS, M.R.C.P. (LOND.), F.R.C.S. (ENG.)*
Department of Thoracic Surgery, Groote Schuur Hospital, Cape Town

and

C. N. BARNARD, M.D., M. MED. (U.C.T.), M.S., PH.D. (UNIV. OF MINNESOTA)†
Department of Surgical Research, University of Cape Town, Cape Town

This paper, which describes our early experiences with the Sigmamotor pump and Bubble Oxygenator, is designed to assist others similarly interested in cardio-pulmonary bypass. Our methods have been greatly influenced by the pioneer work of Lillehei and his team (at the University of Minnesota) and of Kirklin (at the Mayo Clinic).

Numerous artificial oxygenators are available to-day, and all employ one of three basic methods of extra-corporeal arterialization of venous blood. These 3 methods are:

(*a*) Bubble oxygenation in which oxygen is introduced directly into the venous blood;[1, 2]

(*b*) Film oxygenators, in which the red cells are also exposed directly to oxygen by being spread in thin layers over a large surface;[3, 4]

(*c*) Membrane oxygenators in which oxygen and venous blood are exposed over a large surface separated by a suitable membrane, such as cellulose, permeable to oxygen and carbon dioxide.[5]

In Cape Town we have used the Helix-Reservoir Bubble Oxygenator as described by DeWall.[6, 7] This oxygenator has been chosen because it has withstood the test of time, and

* Head of the Department of Thoracic Surgery.
† Director, Department of Surgical Research.

also because it is better known to us. The apparatus has been fully described in numerous publications by the Minnesota group and will only be given brief mention in this article.

The plastic containers of the oxygenator which are in contact with the blood are made by Mayon. It is a pure polyvinyl plastic hose. Three short segments of latex rubber tubing (internal diameter 1 inch) are used in the circuit through the pumps. We have used the Sigmamotor pump† Model TM2 in the main circuit, and Model TM4 in the cardiotomy return circuit. Special highly polished stainless steel connectors are used to connect the various plastic components in the circuit. These connectors do not have abrupt shoulders or other obstructions and potential turbulence is minimized.

The components of the oxygenator are connected as shown in Fig. 1. Blood is drained by gravity from both venae cavae into a venous well, which is placed close to the operating table, the bottom of the well being about 20 inches below the level of the right atrium. The well is adjustable and can be raised or lowered to decrease or increase the venous return.

Blood from the venous well is pumped through the venous circuit into a vertical mixing chamber, where it is mixed with 100% oxygen. The oxygen input to the mixing chamber is 3–4 times the blood volume input and enters through an oxygen diffuser plate at the bottom of the mixing chamber. The blood-oxygen mixture rises in the mixing

† Sigmamotor Inc., 3 North Main St., Middleport, N.Y.

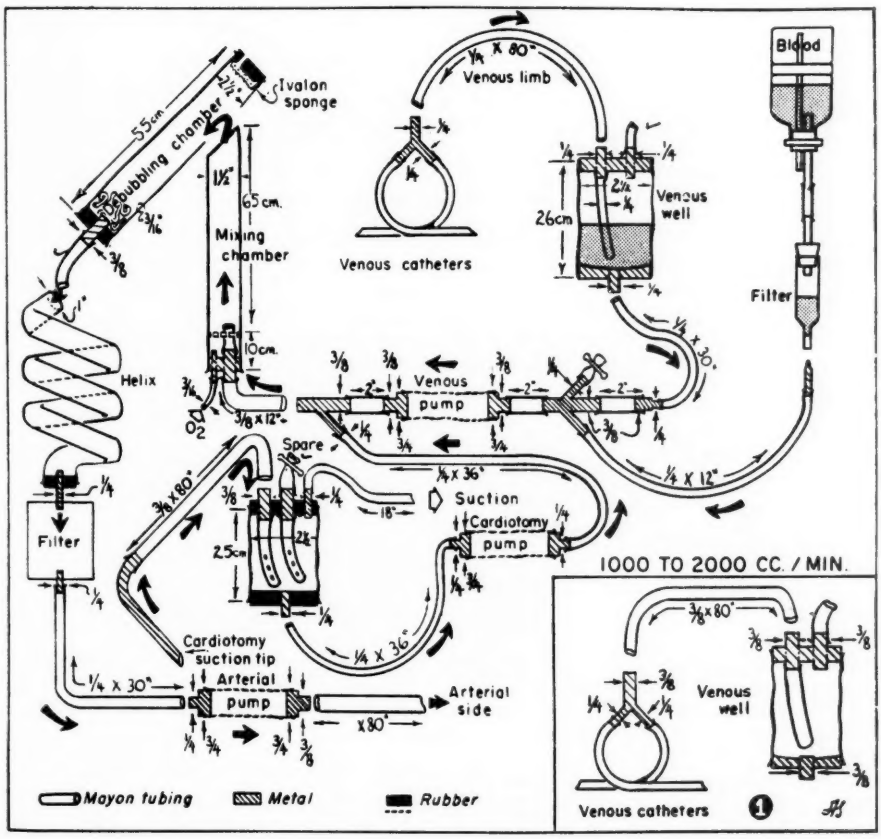


Fig. 1. Assembly of DeWall Oxygenator for Flows from 500 to 1000 c.c. per Minute.

chamber and then empties into the debubbling chamber.

The debubbling chamber lies at an angle of about 50° with the horizontal and is designed to dissipate bubbles and separate the excess oxygen and CO_2 from the arterialized blood. Its walls are coated with patent non-toxic silicone anti-foam substance.*

Blood flows by gravity through the debubbler and empties into a helix which is wound on to an aluminium stand and placed in a Perspex waterbath, the temperature of which is thermostatically controlled between 38° C. and 41° C. The helix is made of 1¼-inch internal diameter Mayon tubing, and its length is such that it will accommodate a volume of blood equal to one minute's flow rate plus 400 ml.

The helix acts as a reservoir and in addition removes any free gas remaining in the blood. The mechanism of this action was described by DeWall *et al.*[3]

From the bottom of the helix, blood passes via a double metal filter† and thence via the arterial circuit to the femoral artery of the subject.

Cardiotomy suction was used in all our cases. Blood is aspirated into the cardiotomy well (suction at −30 mm. Hg. pressure) and is then pumped by a Sigmamotor pump to the venous limb of the main circuit, joining the latter distal to the venous pump (Fig. 1).

The blood flow, which is predetermined for each patient, is calculated according to the body weight or the surface area. One mixing and debubbling chamber is used for flows under 2,000 c.c. per minute. A double set of mixing and debubbling tubes is employed in order to get better oxygenation, when the flow is increased (Figs. 1 and 2).

* Antifoam A, Dow Corning Co., Midland, Michigan.

† List No. 4498 Abbott Labs., North Chicago, Illinois, U.S.A.

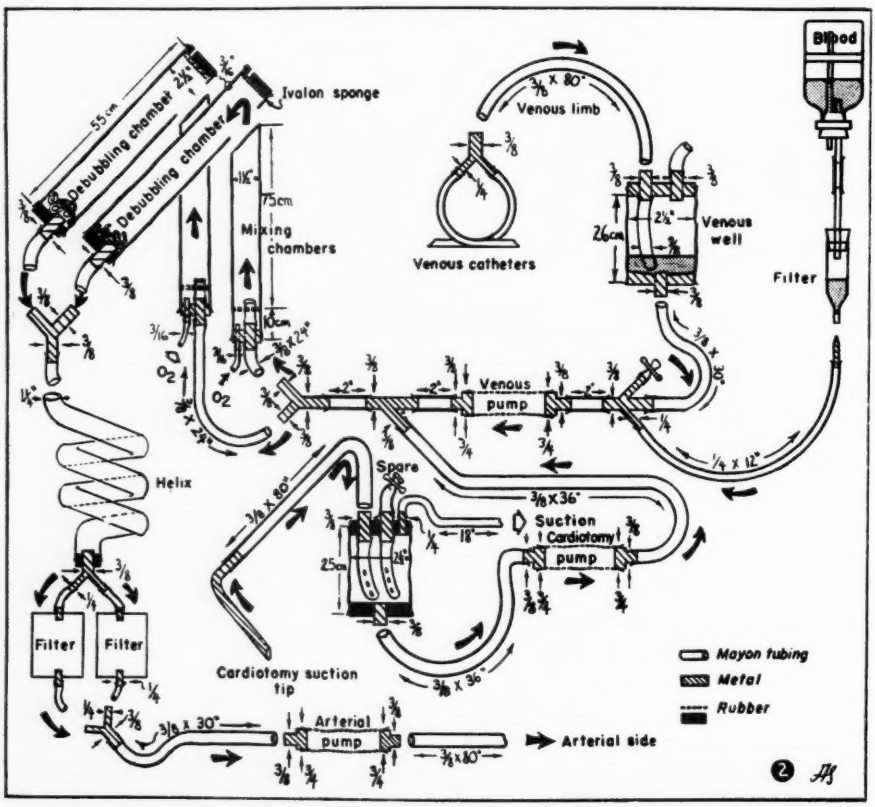


Fig. 2. Assembly of DeWall Oxygenator for Flows from 2000 to 4000 c.c. per Minute.

The assembly and preparation of the bubble oxygenator should be under expert care. The unsatisfactory results obtained by some workers using this apparatus are often due to errors in technique, or unnecessary and undesirable modifications.

PRE-OPERATIVE INVESTIGATIONS AND PROCEDURES

1. *Pathological Investigations*: (*a*) *Blood Investigation.* Data of haemoglobin and prothrombin time estimations, white blood cell and differential counts, bleeding and clotting times, and platelet counts should be obtained.

(*b*) *Blood Chemistry,* including sodium, potassium and chloride estimations and carbon-dioxide combining power should be obtained.

These investigations should be repeated immediately post-operatively in order to check any variation, so that a prompt restoration to the normal can be ensured.

(*c*) *Urinalysis.*

2. *Radiographic Examination.* X-ray films of the chest should be taken before the operation to exclude any sudden change in the pathological condition of the patient, e.g. a pleural effusion.

3. *Electrocardiograms.* Pre-operative electrocardiograms which are taken to provide a 'normal' for comparison purposes will also exclude the possibility of any alteration between the times of diagnosis and surgical treatment.

4. *Skin Preparation.* Preparation of the skin should be commenced 2 days before operation. The skin should be carefully washed and the entire thorax, the abdomen and the groins should be prepared with Physohex 3 times a day. This early skin preparation will also determine any individual sensitivity to the Physohex.

5. *Vitamin K.* Vitamin K should be administered orally, 5 to 10 mg. daily.

6. *Physiotherapy.* Physiotherapy should be started several days before operation to enable the patient to learn efficient breathing methods.

7. *Reassurance.* The patient should be placed in an oxygen tent for short periods in the few days before the operation in order to accustom him to the situation. The patient and the parents should be informed that drainage tubes will be used, so that the post-operative appearance will not be too unexpected.

Important aspects in the pre- and post-operative care of patients undergoing open-heart surgery have been the subject of a separate publication (Barnard *et al.*[8]).

8. *Special Measures.* Special attention should be paid to the upper respiratory tract, as patients with high pulmonary flow or pulmonary congestion are prone to infections of the tracheo-bronchial tree and the lungs. These conditions should be adequately treated before surgery.

Overt or incipient heart failure should be treated with salt restriction, diuretics and digitalization. Routine digitalization, however, is not recommended.

Tracheotomies are performed pre-operatively in patients with high pulmonary artery pressures to enable one to deal more adequately with secretions post-operatively and to assist respiration in this period if necessary.

ANAESTHESIA AND PRELIMINARY STEPS

An accurate assessment of the weight is made at this stage, care being taken to exclude the weight of blankets, sheeting, etc. The patient is then taken into the theatre.

The patient, having been sedated and given an atropine injection in the ward, is brought to the ante-room of the operating theatre, where intravenous Pentothal is administered. The throat is then sprayed with local anaesthetic and an intra-tracheal tube is passed.

Simultaneously, preparations are being made for the assembly of the pump oxygenator. The apparatus, which must have been sterilized previously, is assembled and calibrated immediately before operation. The pumps are tested for occlusion and calibrated for the flows which the surgeon desires to use.

Electrodes attached to the electro-encephalograph are placed in position as soon as the patient is put on the operating table. Control tracings should be taken before the actual perfusion commences. During the time of perfusion the EEG tracing must be recorded all the time. The tracing will show a good range of movement in patients receiving adequate perfusions. Poor cerebral oxygenation is indicated by a flattening of the EEG tracing (Table I).

While the machine is being calibrated, an incision is made into the left groin and an intravenous catheter is passed into the left long saphenous vein. This is to be able to record venous pressures and to provide a means of administering intravenous therapy if this is required during the operation. The monitoring of these venous pressures is most important, as it will inform the surgeon of the efficacy of the perfusion.

An incision is made over the right femoral artery, which is then exposed, care being taken to deal with all its small branches. A solution of 1% Papaverine is kept in contact with the artery in order to prevent contraction, so that the largest size catheter can be inserted, for it is through this vessel that the arterial flow will pass from the machine.

Most of the operations will be performed on the right side of the heart, and therefore the patient is kept in the supine position, with both arms abducted, the chest being tilted slightly towards the left side. For operations on the aortic valve or the left atrium the patient is placed in the right lateral position.

TABLE 1: PERFUSION FACTORS IN THREE CASES

No.	*Sex*	*Age*	*Defect*	*Operation*	*Flow Rate in Ml. per Kg. per Minute*	*Total Flow (per Minute)*	*Duration of Bypass (Minutes)*	*E.E.G.*	*Mean Perfusion Pressure (mm. Hg.)*
1	F	18	Valvular Pulmonary Stenosis	Direct vision transpulmonary commisurotomy	70	2,800	15	Good	50–55
2	F	14	A.S.D. (Ostium secundum type)	Closure—interrupted sutures	70	2,500	25	Failed (static electricity)	50–55
3	F	9	A.S.D. (Ostium secundum type)	Closure—interrupted sutures	70	2,300	29	Good	50–55

Skin Incisions. Different incisions can be used. For operations on the pulmonary artery, right ventricle and right atrium a bilateral transverse thoracotomy is performed. Great care must be taken with haemostasis because, once the perfusion is started, the patient will be heparinized and small bleeding points will become potentially dangerous. The left fourth rib is identified and a portion of this is resected, again ensuring the control of all bleeding points. The pleural cavity on the left is then opened towards the sternum. The internal mammary vessels are located, and the artery is isolated and tied distally. A small incision is then made into this internal mammary artery and a small polyethylene catheter is inserted and moved up towards the subclavian. From now on this catheter will be used for monitoring systemic blood pressures. The internal mammary vein on the left is doubly ligated and divided.

The right chest is opened in a similar manner. The internal mammary vessels on this side are carefully identified, ligated and divided. The sternum is then cut in an inverted V position, with the apex placed high to ensure a good apposition when the chest incision is approximated at the end of the operation. The sternal segments should be adequately separated with a spreader. Some of the attachments of the thymus will now be under tension, and may require division.

Pericardial Incision. The pericardium is now opened transversely from the one phrenic nerve to the opposite side across the middle. The incision is curved downwards on the right side so as to allow good access to both venae cavae. When the pericardium has been opened, great care must be taken to see that all bleeding points are controlled with diathermy, for it is from this pericardial edge that bleeding might continue in the post-operative period. The heart must now be inspected to see if a left superior vena cava is present, entering the coronary sinus. The possibility of an aberrant pulmonary vein or a patent ductus arteriosus must be borne in mind.

Taping of Venae Cavae. A tape is placed round each vena cava at its entrance into the right atrium. The ends of each tape are drawn through 2-inch cuffs of rubber tubing. By tightening and cross-clamping the latter once the venae cavae have been catheterized, the entire systemic venous return can be shunted into the venous well. Care must be taken not to include the right phrenic nerve in the tape placed around the inferior vena cava.

Heparinization. As soon as the venae cavae have been encircled with the umbilical tapes

the anaesthetist injects the requisite quantity of heparin into the intravenous tubes (1.5–2.0 mg. per Kg. body weight). From this time on the blood replacement must be done with heparinized blood, and great care must be taken to coagulate every bleeding point. If perchance small vessels have been left untied, considerable blood loss may take place insidiously during the operation.

Catheterization of the Femoral Artery. The right femoral artery, having been exposed, is clamped proximally and distally and a transverse arteriotomy made. The largest possible Bardic* arterial catheter is introduced through this arteriotomy and secured in position with an umbilical tape. A sample of blood under liquid paraffin is taken from the femoral artery for chemical analysis. The arterial catheter is then connected to the arterial limb of the oxygenator in such a manner that no bubbles are trapped at the connexion. To achieve this the blood in the arterial limb must completely fill the tubing so that meniscus bulges from the open end of the tubing. The arterial catheter is then released and the connexion is made as blood begins to flow from this catheter. The connexion is then firmly tied with strong thread to prevent the possibility of its slipping during the perfusion.

Catheterization of the Venae Cavae. Large size Bardic catheters are used for cannulation of the venae cavae and are inserted via the right atrium. The distance from the point of insertion of each catheter into the auricle to each vena cava is estimated. A ring $\frac{1}{8}$ inch in width is cut from a section of rubber tubing and slipped over each catheter to mark this point. A purse-string suture of atraumatic '0' silk is placed around the apex of the right auricular appendage and the 2 ends of the suture are threaded through a short cuff of $\frac{1}{8}$-inch bore rubber tubing. An auricular clamp is then applied below the purse-string, the apex of the auricular appendage is snipped off, and any obstructing musculi pectinati are cut through. As the clamp is released, the inferior vena caval catheter is inserted until the rubber marker is flush with the purse-string, which is pulled tight and anchored by cross-clamping the rubber cuff. A second purse-string is then inserted in the right lateral wall of the right auricle. Traction on the 2 ends of the purse-string causes the auricular wall to 'peak' and a clamp is applied below the purse-string. A longitudinal incision is made in the auricular wall in the centre of the purse-string suture, and as the clamp is withdrawn the superior vena caval catheter is inserted and anchored as before. The 2 catheters are then connected to the venous well and the perfusion can now be commenced.

At this stage great care must be taken, as the presence of the catheters may impede the venous return to the heart, and an already poor pulmonary circulation may be deprived of still further blood flow. Relative speed now becomes important.

The patient is now ready to go on to total cardio-pulmonary bypass. The venous pressure, arterial pressure, the ECG and EEG tracings should be checked before the bypass is started.

CARDIO-PULMONARY BYPASS

At a signal given by the surgeon the clamps are removed from both the arterial and venous lines, and the pump is switched on. Changes in the heart rate and size should become evident, because the circulation is now being maintained by both the heart and the pump. The vena caval tapes are now tied firmly around the catheters so as to divert all the blood flow from the body into the venous well, and thence to the pump oxygenator. Some blood will, of course, continue to flow into the heart, which it reaches through the coronary sinus from the coronary arteries. This flow will pass from the right auricle into the right ventricle and thence into the lungs. It is, however, moderate in amount, and when a sufficiently high pressure is reached in the left ventricle, the excess blood will be forced up into the aorta. At this stage the anaesthetist can stop assisting the respirations of the patient.

Cardiac Arrest. Cardiac arrest is not an essential part of all open heart operations. Its main purpose is to provide a stationary heart while repair measures are being carried out. Cases of pulmonary valvotomy and infundibular resection, auricular septal defect and small ventricular defects do not need arrest of the heart. Many surgeons do not arrest the heart even while they are doing repairs such as are required for Fallot's tetralogy and large ventricular septal defects, though there is no doubt that an arrested heart does facilitate the surgery.

Cardiotomy. The right atrium or the right ventricle will be opened depending on whether an auricular or ventricular manoeuvre is necessary. Description of these methods is beyond the scope of this paper.

* Bardic No. 1055. Manufactured by C. R. Bard Inc. U.S.A.

THE SURGICAL MANOEUVRE

The surgeon has approximately one hour in which to do the surgical repair. The operation, however, should always be performed as expeditiously as possible. It must be stressed that a coronary flow is still present in all cases in which the pump oxygenator is used. The excess blood returning to the right auricle through the coronary sinus may so obscure the operation site that it is imperative to remove it by means of a special coronary sucker. The blood is removed by this special tube, which passes through another smaller Sigmamotor pump, and is then directed into the bubble oxygenator. The heart can thus be kept relatively dry in spite of some circulation taking place through it, and this circulation is not lost to the pump oxygenator.

It is very evident that blood loss has to be carefully controlled. Some blood may have to be removed by the ordinary suction apparatus, and is thus lost to the pump oxygenator, and must be replaced. During the perfusion careful attention must be directed to the level of blood in the venous reservoir and in the helix. Inspection of these 2 sites will determine whether the blood is escaping from the patient more quickly than it is being pumped back by the arterial pump. Slight elevation of the venous reservoir or acceleration of the arterial pump will counteract this discrepancy.

Certain continuous recordings must be performed during the perfusion. The EEG tracing will indicate clearly whether there is any deficiency of oxygen to the cerebral circulation. A flattened curve is of serious import; a curve of small peaks indicates that insufficient oxygen is reaching the brain, while a good, well-peaked curve is indicative of adequate oxygenation. Simultaneously the systemic arterial pressure, which is recorded from the internal mammary artery, will indicate the adequacy of the outflow from the pump through the femoral artery. Pressures of 40 or 50 mm. Hg are insufficient, and the flow should be accelerated. A mean pressure between 60 and 70 mm. Hg is a sign that the pump oxygenator is working well.

A rise in the venous pressure is evidence of some obstruction to the return of blood from the vena cava to the venous well. This obstruction may be caused by kinking of the catheters or the fact that the catheters have not been placed properly. This defect, if present, should immediately be corrected.

Repair of the Cardiotomy Incision. Skilful and careful repair of all incisions will guard against air being trapped in the heart, and escape of blood due to loose suturing. Insertion of mattress sutures up and down the cardiotomy incision with re-inforcing sutures, if necessary, is the method of choice.

Cessation of Bypass. When it is desired to stop the perfusion the tape around the superior vena cava is released, and intermittent positive pressure respiration is recommenced. The venous blood now enters the heart and the latter gradually begins to take over the circulation. If the beat remains steady, the inferior vena caval tape is released and, after a few minutes, the pump is turned off and the arterial and venous limbs of the circuit are clamped. The blood in the mixing and debubbling chambers is allowed to flow into the helix. Any change that may have occurred in the patient's blood volume during the perfusion can now be estimated, as one knows the initial level in the helix and the amount of blood added to the circuit during the perfusion. For example, if the final level in the helix is 200 ml. above the starting level and 200 ml. of blood was added during the perfusion, then there has been no change in the patient's blood volume as a result of the perfusion. Allowance of course must be made for blood which may have spilled into the pleural cavities and thus not returned to the extracorporeal circuit.

Removal of Catheters. The venous catheters are removed one at a time, the defects in the auricle being closed by tying the purse-string sutures which are already *in situ.*

Protamine Injection. When the surgeon is satisfied that the circulation is being adequately maintained by the heart, the anaesthetist injects intravenous Protamine Sulphate, which counteracts the action of the heparin, and helps to restore the normal blood-clotting time. One half of the calculated dose of Protamine Sulphate is injected intravenously, the remaining half being administered slowly during the next half hour. The total dose of Protamine Sulphate which we have used is equal to twice the amount of heparin originally injected. A sample of arterial blood is taken from the arterial catheter, this catheter is then removed, and the arteriotomy is repaired with 5–0 silk suture.

Closure of Thoracotomy. Every possible point from which bleeding in the post-operative period can occur is now carefully inspected and, if necessary, these bleeding points are either ligated or cauterized. The important areas are those where the inferior and superior venae cavae were looped, the 2 incisions in the right atrium through which the venae caval catheters were introduced, the ventriculotomy

or atriotomy, the pericardial edge and the wound. When the surgeon is completely satisfied that all bleeding points have been dealt with adequately the chest is drained through 2 well-placed drainage tubes on each side of the chest, and the chest incision is now closed in layers. The sternum must be carefully approximated and kept in position with wired sutures. It is, of course, not only unnecessary but dangerous to attempt to close the pericardial incision. After closure of the chest the drainage tubes are connected up to negative pressure suction maintained at about 20 cm. H_2O. The patient is then prepared for an immediate post-operative X-ray film of the chest.

The patient is again weighed and checked to see if there has been any blood loss, and a careful check is made of the pump oxygenator to see whether there is an excess or loss of blood as a result of the perfusion. Any loss to the patient is replaced by citrated blood.

POST-OPERATIVE CARE

In the immediate post-operative phase, the careful measurement and replacement of blood loss from the chest catheters and the care of the tracheo-bronchial tree are most important. Careful suction will clear the secretions from the mouth, the naso-pharynx and the hypopharynx. Humidified oxygen, often supplemented with bronchial detergents, is also recommended.

Electrolyte balance is not a problem in the post-operative phase unless there are unusual losses. Intravenous fluid should be limited to 1.5–2.0 ml. per Kg. per hour for the first 24 hours to minimize the risk of pulmonary oedema. Sodium chloride is administered in a quantity sufficient to cover the losses due to gastric suction and sweating.

The prevention of acidosis in the post-operative period is of great importance. An adequate circulation is the most important single factor in the prevention of this grave complication. Restlessness should be controlled by sedatives, high temperatures by tepid sponging, and sodium bicarbonate should be used.

Heart failure in the post-operative period should be treated in the usual manner. A temporary cardiac decompensation that occurs 10–14 days after surgery due to a traumatic myocarditis is occasionally seen, particularly in patients with a low cardiac reserve pre-operatively. This can be detected early by following the daily weights. The condition responds well to digitilization and salt restriction, and the ultimately good prognosis is in no way jeopardized if the case is properly managed.

Complete heart block is treated with a myocardial electrode connected to an artificial pacemaker constructed to give a small voltage (1 to 10 volts). Isuprel is occasionally utilized to supplement the pacemaker and facilitate conversion to sinus rhythm.

Antibiotics are used for 10–12 days post-operatively. The patients are discharged about 21 days after surgery (Table 2).

TABLE 2: RESULTS OF TREATMENT OF THE FIRST THREE CASES*

No.	*Condition on Leaving Table*	*EEG on Leaving Hospital*	*Result of Operation*	*Duration of Post-Operative Hospitalization*
1	Awake—Satisfactory	Unchanged	Satisfactory	21 days
2	Awake—Satisfactory	Unchanged	Satisfactory	28 days
3	Awake—Satisfactory	Unchanged	Satisfactory	21 days

* Up to now we have done 6 cases, one of whom died 48 hours after operation.

CONCLUSION

The introduction of the pump oxygenator has permitted thoracic surgeons to explore a new and exciting branch of their work.

The entire heart is now accessible, and with increasing skill and experience, more and more sufferers from unusual cardiac conditions should be assisted to a normal life.

OPSOMMING

Die beskikbaarstelling van 'n pomp-oksigeneertoestel het dit vir borschirurge moontlik gemaak om 'n nuwe en opwindende vertakking van hul werk te eksploreer.

Die hele hart is tans bereikbaar, en met toenemende vernuf en ondervinding, sal dit moontlik wees om meer en steeds meer lyers aan buitengewone harttoestande te help om na 'n normale lewe terug te keer.

We wish to thank the following: Dr. Burger, the Medical Superintendent, for permission to report the cases treated surgically; Dr. S. Berman, the Physician in charge of the electrocardiograph; Dr. Ozinsky, who was in charge of the anaesthesia; the Assistant Surgeons, the Nurses and the Technicians, all of whom are part of the surgical team; and the Cardiac Clinic of the Department of Medicine, where the cases were investigated.

REFERENCES

1. Lillehei, C. W., DeWall, R. A., Read, R. C., Warden, H. E. and Varco, R. L. (1956): Diseases of the Chest, **29**, 1–8.
2. DeWall, R. A., Warden, H. E., Read, R. C., Gott, V. L., Ziegler, N., Varco, R. L. and Lillehei, C. W. (1956): Surg. Clin. North Amer., **36**, 1–10.
3. Kirklin, J. W., Donald, D. E., Harshbarger, H. G., Hetzel, P. S., Patrick, R. T., Swan, H. J. C. and Wood, E. H. (1956): Ann. Surg., **144**, 2–8.
4. Kay, E. B., Zimmerman, H. A., Berne, R. M., Hirose, Y., Jones, R. D. and Cross, F. S. (1956): J. Amer. Med. Assoc., **162**, 639-41.
5. Kolff, W. J., Effler, D. B., Grives, L. K. and Peereboom, G. (1956): Cleveland Clinic Quart., **23**, 69-97.
6. DeWall, R. A., Warden, H. E., Varco, R. L. and Lillehei, C. W. (1957): Surg. Gynecol., Obstet., **104**, 699.
7. DeWall, R. A., Warden, H. E. and Lillehei, C. W. (1958): *Extracorporeal Circulation*, p. 41. Springfield, Illinois: Charles C. Thomas.
8. Barnard, C. N., DeWall, R. A., Lillehei, C. W. and Varco, R. L. (In the press).

OPEN HEART SURGERY WITH THE PUMP OXYGENATOR

A REVIEW FOLLOWING VISITS TO CARDIO-VASCULAR CENTRES IN THE UNITED STATES OF AMERICA

DAVID ADLER, F.R.C.S., ED.*

and

DENIS FULLER, F.R.C.S., ENG.*

Johannesburg

During October and November 1957 one of us (D. A.) visited Gross in Boston, Kay, Effler and Clowes in Cleveland, Kirklin and Ellis at the Mayo Clinic, Wangenstein, Lillehei and Varco at Minneapolis and Glover and his associates at Philadelphia to ascertain by personal contact the status of open heart surgery with the pump oxygenator. A fortnight was spent in Denver where Swan and Grow had an extensive experience of open cardiotomy under hypothermia. The former had also used an oxygenator system for several years but was in the process of establishing a machine which we subsequently ordered.

A thorough appraisal of the available data had decided us in favour of the pump oxygenator used by Dr. Robert Gross of the Children's Medical Centre in Boston. We felt confident that the simplicity of this machine would enable us to use it safely in Johannesburg for human surgery within a few months.

In May and June 1958 one of us (D. F.) spent 4 weeks with Gross in Boston with the object of obtaining first-hand practical knowledge of the application of this type of pump oxygenator to human surgery, to study the clinical problems encountered in its use, their prevention and their treatment.

A further pilgrimage was also made to Kirklin at the Mayo Clinic and to the pioneer group working with Lillehei at Minneapolis to confirm our impressions that the Gross-type of pump oxygenator was, at that time, the best commercially available machine. Effler and Kay were also visited in Cleveland in view of their vast clinical experience with their modification of the disc oxygenator, the basis of the Gross machine.

This article will deal with the main principles of pump oxygenators and compare the various methods.

The evolutionary history of pump oxygenators will not be entered into except to record that some of the first clinical work was done in Stockholm by Bjorck and at the Post-Graduate School in London by Melrose, but due to poor financial backing further research was slow. In the United States, on the other hand, with a realistic appreciation of the need for research on a large scale, experimentation was performed at a fantastic rate and very soon American experience was adequate and encouraging enough for clinical application. Experimentation was carried out with different methods and in the space of a few years the 3 different principles of oxygenation were successfully applied in human cases. At present,

* Thoracic Surgeon.

in many of the pioneering centres in the States, cases are being operated upon daily and, at one centre at least, 3 have been performed in one day. In spite of this rapid turnover, there are long waiting lists of cases at these centres and it will take a considerable time to reduce them. This position has been reflected in this country in the long wait for children who have required surgery overseas.

METHODS OF OXYGENATION

These methods are three-fold:

(*a*) Surface oxygenation.
(*b*) Diffusion through a membrane.
(c) Bubble oxygenation.

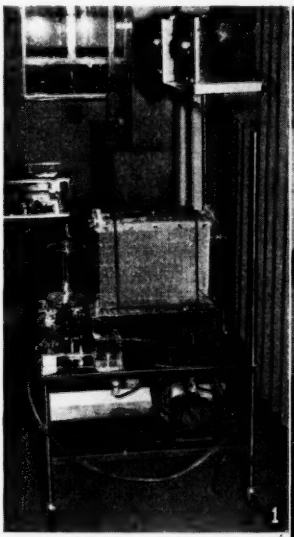
(*a*) *Surface Oxygenation.* There are two common methods of doing this.

i. Running the blood over a series of stainless steel screens, as practised by the Mayo Clinic team. (Fig. 1 illustrates a simplified screen oxygenator available commercially).

ii. Filming the blood on a series of rotating metal discs, as used by Kay of Cleveland and modified by Gross of Boston. It was our impression from discussion with a large number of cardiac surgeons and from information obtained from manufacturers that this was the most popular method of oxygenation. Fig. 2 is a reproduction of the Gross model of disc oxygenator as modified for our use.

(*b*) *Diffusion Through a Membrane.* This was first demonstrated by Kolff as a practical procedure and put to clinical use in his artificial kidney. Clowes of Cleveland, working with Kolff, has evolved a satisfactory oxygenator which he has successfully used clinically. This membrane oxygenator has the theoretical advantage that the blood does not come into direct contact with the perfusing gases. Fig. 3 is a diagrammatic representation of the Clowes Membrane Oxygenator.

(*c*) *Bubble Oxygenator.* This has been extensively used in over 500 cases by Lillehei's



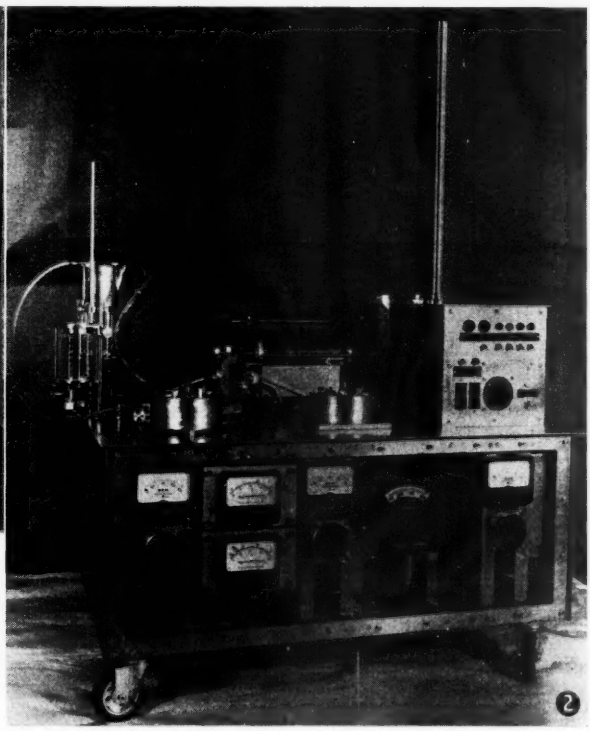


Fig. 1. A commercial variety of the screen oxygenator. Note the vertical stainless steel screen mesh, sixteen sheets in all, enclosed in plastic case.

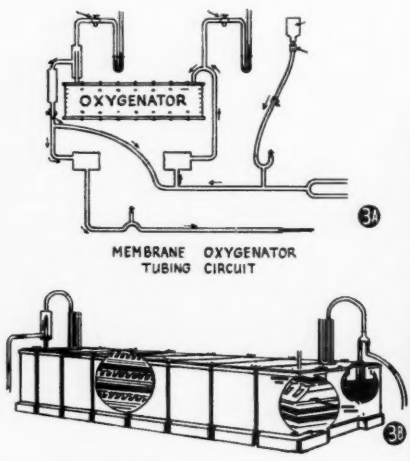
Fig. 2. Our modification of the Gross type disc oxygenator. At the back is the 12 inch oxygenator. This is interchangeable with 17 and 21 inch oxygenators. (*Acknowledgment:* S.A. Glew, Framingham, Mass.)

group in Minneapolis. To this group must remain the distinction of popularizing pump oxygenation and proving the undoubted practicability of these methods. However, bubble oxygenation has inherent dangers either not encountered or more easily overcome in the other methods and, because of this, in spite of its easy applicability, has many antagonists. The lesser cost of this equipment has enabled many hospitals to install it. In spite of the initial extensive laboratory trials in these hospitals, effective use of the so-called 'Lillehei set-up' has not been attained by most. Thus far our personal experience in Johannesburg, where the Nuffield Cardio-Pulmonary Research Team has been working with this type of apparatus for several months, we think parallels that of most other units. There is no doubt that the equipment can be used satisfactorily, but it requires much closer co-operative effort from all concerned and is not as simple in its application as one would like. Fig. 4 is a reproduction of the commercially available de Wall-Lillehei Bubble Oxygenator with Sigmamotor pumps. (This has recently undergone further modification).

COMPARISON OF METHODS OF OXYGENATION

(*a*) *Surface Oxygenation*: 1. Screen.
2. Disc.

Both produce minimal trauma to the blood and provided adequate heparin is used, little or no loss of fibrinogen or platelets will result. This lessens one of the real post-operative problems, viz. that of bleeding due to thrombocytopaenia and afibrinoginaemia. Haemolysis is slight and, following a run of from 1–2 hours at high flow rates, does not produce any significant rise in free plasma haemoglobin. The percentage of oxygenation, however, varies with each method. With the disc oxygenator a greater amount of blood can be oxygenated merely by the addition of further discs or by increasing the speed at which they rotate. The largest available oxygenator will accommodate 124 discs. With the Gross machine 6 litres of blood have been oxygenated per minute to 98% saturation. With the screen oxygenator, as at present constructed, no more than 16 screens can be used. Furthermore, blood does not cover the screens evenly, but tends to run down in rivulets. This has partly been solved by a method of distribution of the blood at



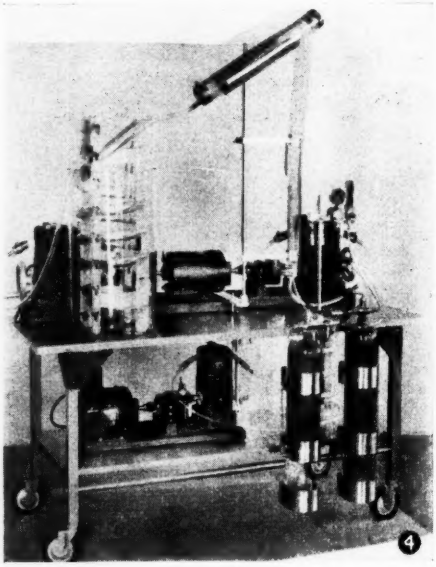


Fig. 3. Diagram of Oxygenator and Blood Circuit.

A. Diagrammatic representation of the membrane oxygenator.

B. Sectional diagram of the membrane oxygenator showing how the mats are tiered upon each other.

Fig. 4. A commercial variety of the Bubble Oxygenator and Sigmamotor Pump.

the top of the screens but, in spite of this, even filming does not occur. It is doubtful, therefore, whether adequate oxygenation would occur if a flow of greater than 3 to 3.5 litres per minute were needed.

The disc oxygenator and all parts coming into contact with the blood are sterilized by autoclaving after assembly. The oxygenator can therefore be stored away sterile and ready for use. The screen oxygenator is made up in a plastic container, as are the collecting chambers and filters, and cannot be autoclaved. Chemical sterilization, therefore, is used and although satisfactory has theoretical disadvantages.

Cleaning of the disc oxygenator system is easy and is effectively done by immersing in a trough of running water for an adequate period. The screen oxygenator requires much cleaning of fibrin and clot from the interstices of the screens. Retained foreign matter may be pyrogenic and produce severe reaction.

(*b*) *Membrane Oxygenation.* This oxygenator is still in an experimental phase, although Clowes has used it on human subjects. In this apparatus blood and oxygen do not come into direct contact with one another. Gas diffusion occurs across a membrane. Initially polythene membrane was used but now Teflon is employed. This membrane is a $\frac{1}{2}$ to $\frac{3}{4}$ mil (1 mil = 1/1000th inch) thick. The material is discarded after use. At present Teflon costs $2\frac{1}{2}$ dollars (about 18 shillings) per unit in the U.S.A. and the number of units depends upon the estimation of the oxygen requirements of the patient. For an adult 14 to 20 units are required. Sterilization is effected by running chemicals through the oxygenator. The assembly of the units is rather cumbersome but it does have the advantage of requiring less blood for priming (1.5 litres as opposed to 2.5–3.5 litres with other oxygenators). Oxygenation occurs in a completely closed circuit and, provided there is no blood loss, the apparatus requires no adjustment once it is running satisfactorily. The oxygenator does not contribute in any way to blood destruction.

(*c*) *Bubble Oxygenation.* There are many varieties of bubble oxygenator. In essence they are the same. Oxygen is bubbled through a column of blood. The blood froths and foams and runs into a reservoir where it can settle and the bubbles be eliminated. Defoaming agents and other devices are used to eliminate the bubbles, which are a real danger to the patient should they enter the circulation. The apparatus for this method of oxygenation is readily made or obtained and is inexpensive. Much of it is disposable. The bubbling, however, may increase haemolysis and add to the amount of blood destruction which, to a greater or lesser extent, is inherent in any method using an artificial pump.

PROBLEMS OF PUMP OXYGENATION

In order to fulfil physiological requirements, this apparatus (which consists of electric motors propelling blood through plastic tubes and one or other oxygenating system) must be able to do the work of heart and lungs. Furthermore, the ideal is a system which adds no risk and does not alter the blood composition or chemistry. The ideal machine has not yet been developed, although it is safe to state that a number of existing models do little damage to the blood if run for periods of not greatly in excess of one hour.

It has been customary at most centres to monitor the blood during the 'run.' Oxygen and carbon dioxide saturation and tensions have been recorded by oximeter or polarograph. Acidosis has been encountered as a major problem and blood pH estimations have been necessary. Some clinics have preferred to estimate the alkaline reserve and lactic acid as a better index of acid-base change. With most systems a respiratory alkalosis can be achieved and this is preferable to an acidosis. Nevertheless, even in the presence of a respiratory alkalosis (viz. sufficient washing out of CO_2 from the blood) a metabolic acidosis may develop if the tissues have developed an oxygen lack. This is apt to occur if the rate of perfusion is inadequate. Similarly, stored blood (if not used shortly after collection or not preserved at 4° C.) will undergo anaerobic glycolysis and become acidotic. When one realizes that 5–7 pints of blood may be needed to prime the apparatus, one can readily appreciate that acidotic blood in the machine will greatly alter the blood chemistry of a small patient. It has been estimated that lactate will accumulate in blood stored at 37.5° C. at the rate of 16.5 mg. per 100 c.c. per hour. Blood, therefore, is collected overnight in heparin solution to which glucose has been added and is immediately refrigerated or else is obtained immediately before operation. A further problem in the storage of blood is the fact that platelets are destroyed.

Electro-encephalography will give a good index of the state of the cerebral oxygenation. With inadequate perfusion the brain waves

diminish in amplitude and frequency and ultimately cease. Systemic arterial and venous pressure recordings can be made to gauge the adequacy of perfusion. A mean arterial pressure of above 80 mm. Hg is generally adequate, while the venous pressure should show little or no rise.

In spite of the various devices still being used for monitoring during a run, most centres are now giving them up. From extensive experience they have found that, provided the venous and arterial cannulae are of adequate size and well placed, all essential criteria will be met. Gross, e.g. now only checks the oxygenation by oximetry and the pH during and after a 'run.' It is essential that the blood should not clot during the by-pass which, if prolonged, will demand a further estimate of heparin requirements.

With the simplification of monitoring devices the equipment in the operating theatre has been minimized, and indeed Gross now uses only one nurse to prepare and operate the pump. However much one may wish to simplify the technique, we think the haematologist and the biochemist will remain indispensable, as their services are required both during and after perfusion. A further problem is the avoidance of heat loss from the circulating blood. However, as there are divergent views on the advisability of allowing the body temperature to fall, suffice it to state that a small drift in temperature is probably not harmful.

POST-OPERATIVE PROBLEMS

With adequate flow and oxygenation and in the absence of air and fibrin emboli, death should not occur during the by-pass. In fact, should it occur at this time, only the electroencephalogram would confirm it.

Heart block may occur on the table, in which case wire electrodes from a pacemaker are attached to each side of the heart, brought out through the chest wall and may be required to be left in place for up to 3 weeks until adequate cardiac function is established. In those operations where it is suspected that heart block may occur, the external electrodes of the pacemaker must be strapped on to the chest wall and attached to the monitoring system. With the more advanced models of pacemaker, visual and auditory recordings of the heart beat are made continuously and the apparatus can be set to act automatically.

Haemorrhage may be due to insufficient or excessive use of protamine to neutralize the heparin, to thrombocytopaenia, to fibrinolysis or to a bleeding vessel. Each will require the appropriate treatment.

Cerebral damage should not occur if the perfusion has been adequate but could be due to emboli of gas, fibrin or an antifoam material if too liberally used in a bubbling system.

Acidosis may develop and should be anticipated if the perfusion was inadequate, when the blood pH will show a drop in the immediate post-operative period. It can be overcome by giving base in the form of sodium bicarbonate or molar lactate.

Lung infection and atelectasis are problems inherent in any operation. They can be avoided by preventing the accumulation of bronchial secretion, by physiotherapy and antibiotics to overcome infection. One should realize that many of these operations will be performed on poorly developed, weak children in whom frequent bronchoscopy or tracheotomy may be needed.

The post-diffusion syndrome consists essentially of post-operative hypotension associated with restlessness and peripheral cyanosis. Death frequently occurs. The syndrome may follow prolonged hypotension during surgery, not necessarily during perfusion alone, but an interesting theory is that serotonin may be responsible. This substance is liberated during platelet destruction and produces pulmonary hypertension with resultant lowering of left ventricular output. Investigations have shown that Phenergan diminishes pulmonary hypertension while Lysergic Acid Diethalimid (LSD) is a specific serotonin antagonist.

CONCLUSION

We feel that the last barriers of cardiac surgery have been overcome with 'dry heart surgery' and that this branch of the art of healing must now be recognized as an established procedure comparable to the surgery of other organs. As in these other spheres, South African surgeons (assisted by their medical colleagues) will be able, we feel sure, to maintain the high tradition of service to mankind by restoring to health many who have been disabled and by preventing disability in those who yet remain well despite their afflictions.

Our clinical experience in the use of the Gross type of pump oxygenator forms the subject of a further article in the press.*

ADDENDUM

Since this article was submitted one of us (D. A.) has visited London, where British conservatism and, perhaps, even obstruction on the

* Thus far we have done 8 of these cases.

part of those in authority, has held back progress somewhat. Nevertheless Cleland, at the British Post-Graduate School, is regularly using the Melrose type of disc oxygenator and Sir Russell Brock (with a South African practitioner, Mr. Denis Ross) is employing the de Wall type of bubble oxygenator. The diversity of opinion is reflected in the fact that Holme Sellors of the Middlesex Hospital has ordered the Mayo Clinic oxygenator, Tubbs of St. Bartholomew's Hospital has a disc oxygenator and Sir Russell Brock at the Brompton has ordered the Mark Screen!

A prophet is rarely honoured in his own country, for many London surgeons have visited Lillehei in the U.S.A., but few have been to see Cleland at the Post-Graduate School.

OPSOMMING

Volgende op hul onlangse besoeke aan die V.S.A. verstrek die skrywers 'n oorsig van die kenmerke van die tans beskikbare hart-long-masjiene (pompoksigeneerders).

Hulle geraak tot die slotsom dat die skyfvormoksigeneerder eenvoudig, veilig en doeltreffend is. Hulle verkies die pomp van die de Bakey-tipe, want dit veroorsaak minder hemolise as dit meer as 20 minute lank gebruik word. Hulle beveel dus 'n samestelling van hierdie twee soorte apparaat aan—soos die masjien wat deur Gross in die Kinderhospitaal, Boston, gebruik word.

Uitgebreide operasie-ondervinding met die Grosstegniek het die mening laat posvat dat oksigenering en sirkulasie doelmatig genoeg is om 'n vereenvoudiging van die ietwat ingewikkelde monitorwerk wat vroeër as onontbeerlik beskou is, toe te laat.

Die skrywers verstrek ten slotte 'n kort opsomming van die eerste pasiënte op wie hulle in Johannesburg operasies uitgevoer het.

NOTES AND NEWS : BERIGTE

Mr. L. Stein, F.R.C.S., has recently returned from a visit overseas where he spent some months in London and in the U.S.A. doing post-graduate surgery.

Mr. Stein has relinquished his full-time hospital appointment and has begun practice as a specialist surgeon at 104, Lister Buildings, Jeppe Street, Johannesburg. (Telephones:—*Rooms:* 23-7803; *Residence:* 41-2231).

* * *

Dr. Morris Medalie, M.R.C.P.E., Specialist in Diseases of Children, has moved from Medical Centre to 605, Osler Chambers, Jeppe Street, Johannesburg. The telephone numbers remain unchanged.

* * *

Dr. Louis F. Freed, M.A., M.D., D.Phil., D.P.M., F.R.S.S.Af., of Johannesburg, has been invited by Prof. H. Thomae, Director of the Psychological Institute of the University of Erlangen, Germany, to serve as South African Editor of *Vita Humana*, International Journal of Human Development, published by Verlag S. Karger A G., Basle, Switzerland.

Dr. Freed is Lecturer in the Department of Psychiatry of the University of Witwatersrand.

* * *

Dr. J. Fine, of Johannesburg, has left for overseas and will return towards the end of November.

* * *

SKF LABORATORIES AWARD FOR POST-GRADUATE CLINICAL STUDY IN SOUTH AFRICA

Dr. D. I. L. de Villiers

Dr. D. I. L. de Villiers of Standerton has been appointed the first recipient of this Award.

Dr. de Villiers will spend a 2-month period of post-graduate study at the University of Pretoria.

Prof. D. Crichton, the author of the article entitled *The Clinical Work of the Department of Gynaecology and Obstetrics of the University of Natal during 1957*, which appeared in our issue of 20 September 1958, wishes to make the following author's corrections in Table 2 of his communication (at p. 627):

In the last line of the left-hand column of this Table 'Utero-vesical anastomosis' must read 'Uretero-vesical anastomosis' and in line 3 from the bottom of the right-hand column 'Utero-intestinal anastomosis' must read 'Uretero-intestinal anastomosis'.

* * *

FIFTH INTERNATIONAL CONGRESS ON NUTRITION

This is to be held in Washington, D.C., U.S.A., from 1–7 September 1960, under the auspicies of the International Union of Nutritional Sciences.

Details can be obtained from:

The General Secretary, Fifth International Congress on Nutrition, 9650 Wisconsin Avenue, Washington 14, D.C., U.S.A.

* * *

UNIVERSITY OF CAPE TOWN

REFRESHER COURSE FOR GENERAL PRACTITIONERS

26–30 JANUARY 1959

A Refresher Course for General Practitioners will be held, consisting of lectures, ward rounds and demonstrations in Medicine, Surgery, Obstetrics and Gynaecology and the Specialities at appointed times between 8 a.m. and 5.30 p.m. daily.

The Course will probably include the following:

A. *Ward Rounds* with senior members of the teaching staff in Medicine, Surgery, Dermatology, Paediatrics, Obstetrics and Gynaecology.

B. *Panel discussions* by groups of consultants on the following subjects:

Management of Breast Carcinoma.
Oedema and its Treatment.
Assessment and Management of Hypertension.
Infant Feeding.

Virus and Bacterial Diseases.
General Therapeutics in Paediatric Practice.
The Use and Abuse of the Steroid Drugs.
Common Obstetrical and Gynaecological Emergencies.
The Present Day Approach to Diabetes.
The Management of the Ischaemic Limb and the Varicose Ulcer.

A feature of these discussions is that ample opportunity will be provided for members of the panel to answer questions raised by the Practitioners attending the Course.

C. *Demonstrations by the Consultant Staff of the following*:

Anaesthetic Techniques.
Minor Gynaecological Procedures.
Every Day Orthopaedic Methods.

D. *A lecture* on the following subject:

The Value of Hormones in Obstetrical and Gynaecological Practice.

E. *Sessions* 'Any Questions.'

Special sessions will be provided in General Surgery, Medicine, Ophthalmology and Otorhinolaryngology, Paediatrics and Gynaecology and Obstetrics at which a panel of members will answer questions asked by General Practitioners on any subject not covered by the programme of the Course.

The number of Practitioners that can be accepted for the Course is restricted

The fee for the Course will be five guineas, payable in advance to the Registrar, University of Cape Town. This fee should not be sent until the applicant has been notified that he will be admitted to the Course.

Board and lodging will be available at one of the Students' Residences for those desiring it (and for their wives) at a charge of one guinea per day per person.

Applications for admission to the Course, stating whether residential accommodation will be required or not, should be submitted as soon as possible to the Registrar, University of Cape Town, Private Bag, Rondebosch, before Wednesday, 5 November 1958.

* * *

THE PROFESSIONAL PROVIDENT SOCIETY OF SOUTH AFRICA

TWO FURTHER PRESSING NEEDS OF PROFESSIONAL PERSONS NOW CATERED FOR

The outstanding success of the Society which is advancing from strength to strength has encouraged the Board to extend its scope to meet further needs. Two further outstanding optional benefits are now offered in addition to those already available to:

The Dental Association of South Africa.
The Medical Association of South Africa.
The Pharmaceutical Society of South Africa.
The Societies of Advocates of South Africa.
The Association of Law Societies of South Africa.
The South African Veterinary Medical Association.
The Central Council of Land Surveyors of the Union of South Africa.

The Board has successfully concluded negotiations for a Group Life Assurance Scheme and also a Hospitalization Scheme. The following are very brief summaries of these schemes both of which come into operation on 1 November 1958 and are open to all members of the Society.

1. *Group Life Assurance Scheme*: It is the haunting fear of any man with a sense of responsiblity that he may leave his dependants in financial straits, and the most pressing, immediate need is to make adequate provision for them in the event of his death, for a reasonable annual outlay. The cheapest form of security is provided through group assurance, and the Society, guided by its actuary, has accepted a tender for underwriting such a scheme, submitted by the South African National Life Assurance Company Ltd. (SANLAM). This scheme incorporates particularly attractive benefits at remarkably low premium rates. It enables existing members who enlist within 3 months from inception of the scheme, to do so without being called upon to submit proof of insurability—an exceedingly valuable concession to those who have left their youth behind them. This concession is extended to 12 months in the case of those who join the Society after inception of the scheme. Membership of the scheme may continue after the age of retirement from membership of the Society is reached, subject to certain rules of the scheme. The sum assured is in each case related to the number of shares or units of membership held, the member having a choice of subscribing for £20 or multiples thereof to a maximum of £100 for every share held. The maximum sum assured for a member holding the maximum of 50 shares is therefore £5,000. The present premium rate at 1s. 3d. per cent per month is equivalent to £7 10s. per £1,000 per annum or a mere £37 10s. per annum for £5,000. The scheme allows for allocation of any profits to the Society and the Board has power to distribute such profits. For certain purposes such as study loans and partnerships, benefits under the scheme may be ceded to the Society, which will consider providing guarantees on behalf of the member.

2. *Hospitalization Scheme*: This scheme has been devised to assist members in meeting the not inconsiderable costs involved in hospitalization both for themselves and their dependants. Cover is immediate, and no proof of insurability will be required for existing members and new members of the Society who join within 3 months of joining the Society. The Society shall pay to the member an allowance of £2 per day of stay in hospital or nursing home or illness at home under medical supervision with a registered nurse in attendance, subject to a maximum of 200 benefit days for a married man and his family and 100 benefit days for a single member, during any membership year. A special polio benefit including certain medical expenses up to a maximum of £1,000 in any membership year, arising after at least one year's membership, is provided. The aforementioned allowance will be allowed in respect of maternity if this shall arise at least 6 months after commencement of membership. The subscription rates are 4s. per month for a single member and 10s. per month for a married member regardless of the number of dependants.

Provision is made for membership to continue at slightly increased cost after reaching the Society's retirement age, and in the event of the death of a male member, his dependants may continue membership at reduced cost. This scheme might be extended in due course, to embrace a full Medical Insurance scheme.

Both these optional additional benefits offer remarkable value to members, be they very young or already nearing retirement age and existing members should take immediate steps to secure their participation. Those who are not yet members of the Society should not delay in availing themselves of the very wide measure of security afforded by membership. Enquiries should be addressed to the Secretary, P.O. Box 6268, Johannesburg.

* * *

RULES REGARDING CONDUCT OF WHICH THE MEDICAL COUNCIL MAY TAKE COGNIZANCE

RULES 19 AND 19 (*bis*) AS AMENDED BY THE MEDICAL COUNCIL AT ITS MEETING IN SEPTEMBER 1958

Rule 19. Professional Appointments Other Than—

i. Appointments made under the Public Service Act.

ii. Appointments made under the Hospital Ordinances.

iii. Appointments of medical practitioners and dentists to academic or professional posts at universities, research institutions or similar institutions.

A. Medical Practitioners

1. Acceptance by a medical practitioner of any professional appointment unless—

(*a*) a notice inviting applications for such appointment shall have been advertised in a South African medical journal and a similar advertisement or a notice drawing attention to that advertisement has been published in an English and in an Afrikaans newspaper with a national circulation at least fourteen days prior to the date on which the appointment is to be made;

(*b*) details of the proposed contract are made available on request to the Council, the Medical Association of South Africa and all *bona fide* applicants;

(*c*) the contract of appointment is in writing and sets out clearly the professional services which the medical practitioner undertakes to render and the fees or remuneration payable to him for such services by the party with whom he has contracted;

(*d*) the contract provides (i) that the medical practitioner shall receive fees or remuneration exclusively from the party with whom he has contracted, and (ii) that that party shall be liable for such fees or remuneration;

(*e*) the said contract is on a basis which is not derogatory to the medical profession or inimical to the interests of the public.

2. Permitting or suffering his name, profession, qualifications or address to appear on cards, handbills, pamphlets or notifications of any kind which refer in any way to his holding the said appointment; *provided* that a medical practitioner shall not be deemed to have breached this rule if a Benefit Society notifies its members that medical services have been arranged, details of which are available on application.

3. Failure by a medical practitioner who has accepted a professional appointment to submit the contract originally entered into by him, together with any subsequent amendments or addenda thereto, for inspection by the Council within a period of 30 days reckoned from the date of the posting of a registered letter from the Registrar to such medical practitioner at his address as shown in the Register, calling upon him to submit his contract for inspection; *provided* that upon good cause this period may be extended by the Council.

Rule 19 (*bis*). Professional Appointments made under the Hospital Ordinances, and to Academic or Professional Posts at Universities, Research Institutions and Similar Institutions

1. Acceptance by a medical practitioner or a dentist of any professional appointment under a Hospital Ordinance or any academic or professional appointment to a University, Research Institution or similar institution unless—

(*a*) a notice inviting applications for such appointment shall have been advertised, in the case of a medical practitioner in a South African medical journal, or in the case of a dentist in a South African dental journal, and a similar advertisement or a notice drawing attention to that advertisement has been published in an English and in an Afrikaans newspaper with a national circulation, at least fourteen days prior to the date on which the appointment is to be made.

(*b*) details of the terms and conditions under which the proposed appointment is to be made are made available on request to the Council, to the Medical Association of South Africa in the case of the proposed appointment of a medical practitioner, and to the Dental Association of South Africa in the case of the proposed appointment of a dentist, and to all *bona fide* applicants;

(*c*) the contract of appointment is in writing and sets out clearly the professional services which the medical practitioner or dentist undertakes to render and the fees or remuneration payable to him for such services by the party appointing him.

* * *

ELECTRON STERILIZATION OF SURGICAL SUTURES

Streams of high energy electrons are being used by an American firm to sterilize catgut sutures. This method is said to give better results than the conventional heat treatment. According to the manufacturer (Ethicon Inc., of New Jersey), irradiated sutures have greater tensile strength and, being sterilized in sealed containers, are protected against recontamination.

Trays of sutures in their casings pass continuously under the electron beam emerging from the vacuum tube of a linear accelerator. Two electromagnets at the bottom of the tube swing the beam rather like a pendulum to ensure that each suture on the slowly moving tray comes into its range for several seconds.

Sterilization by electrons rather than neutrons or radioactive materials has the advantage that there is no residual radiation; nor does it induce the formation of unwelcome radioactive by-products. It alters the molecular structure of the micro-organisms in or on the suture (and so destroys them) without affecting the structure of the catgut. This development is claimed to promise patients greater safety, faster healing and less tissue reaction.

MEDICAL MEMBERS OF PARLIAMENT

V. Mr. A. Radford, M.P. (*Durban Central*)

VI: Dr. J. van A. Steytler, M.P. (*Queenstown*).
[Photograph: The Cape Argus]

• • •

MEDICAL COUNCIL: APPOINTED MEMBERS

The Minister of Health has appointed the following to serve as members of the Medical Council for the 5-year period 1959–1963:

Prof. S. F. Oosthuizen, Dr. J. J. du Pré le Roux (*Secretary for Health*), Dr. B. P. Pienaar (*vice* the Commissioner for Mental Hygiene, Dr. V. Vermooten), Brig. J. H. Rauch, Dr. C. I. G. Hunter (South West Africa), Dr. R. V. Bird, Mr. W. H. Rood and Adv. J. van Wyk de Vries.

PREPARATIONS AND APPLIANCES

HUMEVAC CAPSULES

A NEW APPROACH TO PREVENTION AND RELIEF OF CONSTIPATION

Parke, Davis Laboratories (Pty.) Ltd., have introduced a new type of non-cathartic faecal softener by the name of *Humevac* Capsules.

Description: Each *Humevac* Capsule contains 250 mg. of the polymer of propylene oxide and ethylene oxide. This acts as a surface tension depressant permitting fluids in the colon to penetrate into, and soften, hard dry faecal matter. This results in a softer and more homogeneous stool which is easily evacuated by normal peristalsis.

Humevac is not in itself a laxative, bulk-producer or lubricant, nor does it possess any of the disadvantages associated with laxatives. The beneficial effect of *Humevac* is based on its ability to soften the stool by a wetting action, which is gradually accomplished after treatment is initiated.

Indications: *Humevac* is not intended to be drastic in action and thus has a wide field of application in many conditions requiring maintenance of soft stools, such as, for example: before and after surgery, during pregnancy and convalescence, invalids and bedfast patients.

Humevac is also useful as an aid in preventing or relieving constipation caused by iron therapy or barium retention enemas used during radiography. It is also indicated in the symptomatic relief of diverticulosis, where the reduction of surface tension may aid in helping food to slide out of the diverticulum, reducing the tendency for gas formation.

Dosage and Administration: Orally. *Adults*: One capsule 3 times a day until the condition is corrected. One capsule daily thereafter as required.

Children: One capsule daily until the condition is corrected. Each dose should be followed by a glass of water.

Infants: Contents of one capsule mixed with milk, fruit juice or solid food.

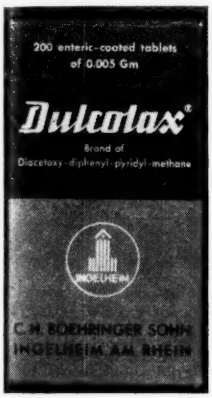
Package Information: *Humevac* Capsules, 250 mg., are supplied in bottles of 30 and 100.

DULCOLAX

(4,4' DIACETOXY-DIPHENYL)-(PYRIDYL-2)-METHANE

Dulcolax is a recently synthesized compound with a new mode of laxative action.

It brings about an evacuation of the bowel by direct contact with the intestinal mucosa.



Its effect is *not* by way of the blood stream, as is the case with many other laxatives; it has no effect on the internal organs such as the liver or kidneys and, being entirely harmless, it may be taken during pregnancy or lactation. Furthermore, due to the enteric coating of the tablets it can be given without harm to gastric ulcer patients.

Dulcolax has all the properties of an ideal laxative.

Dulcolax is non-toxic. It can be given freely to even the most seriously ill patients and has no contraindications.

It has a reliable gentle action; stool consistency can be regulated by adjusting the dose and sleep is not disturbed.

There is no habituation with *Dulcolax* even when taken regularly over long periods.

Its use is in constipation of all kinds; in facilitating bowel movements after operations; in preparing a patient for operation or X-ray examination.

Available: Enteric coated tablets: Bottles of 20's; bottles of 200's.

Suppositories, 6's; suppositories, 50's.

Medical Enquiries: Pfizer Laboratories (Pty.) Limited, P.O. Box 7324, Johannesburg.

SANDOSTEN NASAL SPRAY

Sandoz Ltd. announce the addition of *Sandosten* Nasal Spray to their range of *Sandosten* (thenalidine) preparations.

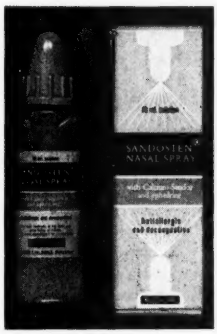
Description:

Thenalidine digluconate	0.5%
Calcium lactobionate	17.5%
Ephedrine HCl	0.9%

Sandosten (thenalidine) is a powerful antagonist of both histamine and acetylcholine with a pronounced action on cell and capillary permeability. Calcium-lactobionate (Calcium Sandoz) potentiates the effect of *Sandosten* and virtually eliminates side-effects.

Ephedrine ensures rapid decongestion of the nasal mucosa.

The use of this combination in the form of a nasal spray has been found very effective in cases of rhinitis.



Indications: Hay fever; allergic and vasomotor rhinitis.

Application: Remove the cap from the nebulizer, insert the nozzle into the nostril and squeeze slowly but firmly. After allowing the nebulizer to fill again completely with air, the procedure is repeated in the other nostril. One spray in each nostril is sufficient, but the application may be repeated several times a day.

Presentation: Plastic nebulizers containing 10 ml. of solution. The nebulizers are only partially filled to ensure proper spray action.

Distributors: Alex. Lipworth Limited, P.O. Box 4461, Johannesburg; P.O. Box 4838, Cape Town; P.O. Box 1988, Durban; P.O. Box 3188, Port Elizabeth.

BUSCOPAN

HYOSCINE N-BUTYLBROMIDE

Much systematic research has been carried out with a view to developing a better tolerated spasmolytic.

A fundamentally new approach was made in the laboratories of C. H. Boehringer Sohn.

A series of quaternary ammonium compounds was produced synthetically from scopolamine. After exhaustive clinical investigation *Buscopan* (Hyoscine-Butylbromide) was made available for world distribution. Since 1951 some 200 papers on the results of clinical experiments with *Buscopan* have now appeared in various medical journals throughout the world.

Buscopan has been able, in spite of the multiplicity of spasmolytic drugs on the market, to gain world-wide recognition and acceptance. It has in many respects the properties of an ideal therapeutic agent, *as it achieves its therapeutic effect without causing unpleasant or toxic side effects.*

It can resolve smooth muscle spasm of the gastro-intestinal tract and of the female genital organs. *Buscopan* is able to overcome smooth muscle spasm of the oesophagus, ureters, urinary bladder and urethra and also of the os of the uterus and the uterosacral ligaments, without any significant side effects on the salivary and sweat glands, the heart or central nervous system.

Buscopan can therefore be given freely according to the individual case—if necessary in high doses over a long period. It may be given without hesitation to children and to patients of all ages.

Available: Tablets: Bottles of 20's; bottles of 100's.

Ampoules: 6's.

Medical Enquiries: Pfizer Laboratories (Pty.) Limited, P.O. Box 7324, Johannesburg.

SYNTOCINON

(SYNTHETIC OXYTOCIN)

Sandoz Ltd. announce the introduction of *Syntocinon* (synthetic oxytocin), the first synthetic polypeptide (octapeptide) hormone available commercially.

Description: Syntocinon is chemically identical with the oxytocic hormone of the posterior pituitary but, instead of being isolated from animal posterior pituitary glands, it is entirely synthetic. This ensures the absence of even traces of vasopressor hormone and of foreign proteins.

Pharmacological and clinical investigations have shown *Syntocinon* to be identical in its oxytocic effect to natural oxytocin B.P. *Syntocinon* is standardized biologically.

Properties: Syntocinon exerts a selective action on the smooth musculature of the uterus, particularly towards the end of pregnancy, during labour and immediately following delivery. It provokes rhythmic contractions of the uterus, increases the frequency and amplitude of existing contractions, and raises the tone of the uterine muscle. The blood pressure is not affected, so that *Syntocinon* may be used without risk in hypertensive toxaemic patients.

INDICATIONS AND DOSAGE

	Intravenous Drip	*Intravenous Injection*	*Intramuscular or Subcutaneous Injection*
Induction of labour at term	1 I.U. in 100 ml. of 5% glucose solution at the rate of 8 to 40 drops per minute, or more, according to the effect.	—	0·5 to 2 I.U. repeatable every 30 to 60 min.
Hyptonic uterine inertia		—	0·25 to 1 I.U. repeatable as required.
Post-partum haemorrhage*	1 to 2 I.U. per 100 ml. 5% glucose solution. Rate of drip may be faster than above.	5 to 10 I.U.	5 to 10 I.U.

*In this indication a more prolonged action is exhibited by ergot alkaloids. (Methergin, Gynergen, Neo-Gynergen, *q.v.*).

Presentation:—Ampoules of 5 units in 0.5 ml., boxes of 6; ampoules of 10 units in 1 ml., boxes of 6.

Distributors: Alex. Lipworth Limited, P.O. Box 4461, Johannesburg; P.O. Box 4838, Cape Town; P.O. Box 1988, Durban; P.O. Box 3188, Port Elizabeth.

REFERENCES

Bainbridge, M. N. *et al.* (1956): Brit. Med. J., **1**, 1133.
Francis, H. H., and Francis, W. J. A. (1956): Brit. Med. J., **1**, 1136.

PREPARATE EN TOESTELLE

HUMEVAC-KAPSULES

'N NUWE BENADERING TOT DIE VOORKOMING EN VERLIGTING VAN HARDLYWIGHEID

Parke, Davis Laboratories (Pty.) Ltd. het 'n nuwe soort nie-purgerende ontlastingsweekmiddel met die naam van *Humevac*-kapsules beskikbaar gestel.

Beskrywing: Iedere *Humevac*-kapsule bevat 250 mg. van die polimeer van propileenoksied en etileenoksied. Die tree as 'n oppervlakspanning-deprimeermiddel op, en stel die vloeistowwe in die dikderm in staat om die harde, droë ontlastingstof binne te dring en dit sag te maak. Die gevolg is 'n sagter, meer homogene ontlasting wat maklik deur die normale dermbewegings afgeskei word.

Humevac is op sigself geen lakseermiddel, massaproduseerder of smeermiddel nie. Die besit geeneen van die nadele wat gewoonlik aan lakseermiddels verbonde is nie. Die heilsame effek van *Humevac* berus uitsluitend op sy vermoë om die ontlasting sag te maak deur 'n benattingseffek—iets wat geleidelik geskied nadat die behandeling van stapel gestuur is.

Indikasies: *Humevac* is nie bedoel om 'n drastiese effek uit te oefen nie. Dit is dus 'n besonder nuttige middel vir die behandeling van talle toestande waar die instandhouding van sagte ontlasting 'n vereiste is, byvoorbeeld: voor en na 'n operasie, tydens swangerskap en herstel, en vir invalides en bedlêende pasiënte.

Humevac is ook 'n nuttige hulpmiddel vir die verligting van die hardlywigheid wat veroorsaak word deur ysterterapie of die bariumbehoud-lawemente wat tydens radiografie gebruik word. Dit word ook aangedui vir die simptomatiese verligting van divertikulose waar die vermindering van die oppervlakspanning die voedsel kan help om uit die uitstulping te gly, en die neiging tot gasvorming kan verminder.

Dosis en Toediening: Mondeling. *Volwassenes*: Een kapsule 3 maal per dag todat die pasiënt se toestand verbeter. Daarna, een kapsule per dag soos benodig.

Kinders: Een kapsule per dag totdat die kind se toestand verbeter. Na iedere dosis moet die pasiënt 'n glas vol water drink.

Babetjies: Die inhoud van een kapsule, gemeng met melk, vrugtesap of vaste kos.

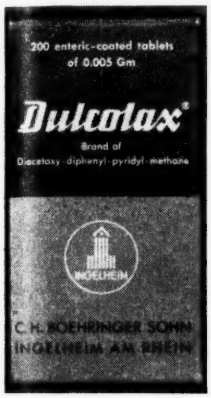
Inligting oor Verpakking: *Humevac*-kapsules, 250-mg., is verkrygbaar in bottels van 30 en 100.

DULCOLAX

(4,4' DIASETOKSI-DIFENIEL)-(PIRIDIEL-2)-METAAN

Dulcolax is 'n onlangs gesintetiseerde samestelling met 'n nuwe soort lakserende effek.

Dit bewerkstellig die ontlediging van die ingewand deur regstreekse kontak met die ingewandslymvliese.



Dit oefen sy effek *nie* uit deur die bloedstroom soos so baie ander lakseermiddels doen nie; dit het geen uitwerking op inwendige organe soos die lewer of die niere nie, en, omdat die volkome onskadelik is, kan dit tydens swangerskap en melkafskeiding geneem word. Temeer, omdat *Dulcolax* 'n dermtablet is, kan dit sonder vrees voorgeskryf word vir pasiënte wat aan maagsere ly.

Dulcolax het al die eienskappe van die ideale lakseermiddel.

Dulcolax is nie-toksies. Dit kan vryelik voorgeskryf word selfs vir pasiënte wat ernstig siek is. Daar is geen kontra-indikasies vir die gebruik daarvan nie.

Dit het 'n betroubare, sagte effek; die vastheid van die ontlasting kan gereguleer word deur die dosis te vermeerder of te verminder, en die pasiënt se slaap word nie versteur nie.

Dulcolax skep nie 'n gewoonte nie, selfs al word dit ook gereeld oor lang tydperke geneem.

Dit word voorgeskryf vir allerhande soorte hardlywigheid; om ingewandsbewegings na 'n operasie te vergemaklik; by die voorbereiding van 'n pasiënt vir 'n operasie of vir 'n X-straalondersoek.

Beskikbaarstelling: Dermtablette: Bottels van 20; bottels van 200.

Steekpille, 6's; steekpille, 50's.

Mediese Navrae: Pfizer Laboratories (Pty.) Ltd., Posbus 7324, Johannesburg.

SANDOSTEN-SPUITMIDDEL VIR DIE NEUS

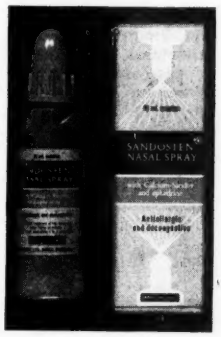
Sandoz Ltd. kondig aan dat *Sandosten*-neusspuit middel nou by hul reeks *Sandosten*- (tenalidien-) preparate gevoeg is.

Beskrywing:	Tenalidiendiglukonaat	0.5%
	Kalsiumlaktobionaat	17.5%
	Efedrien-HCl	0.9%

Sandosten (tenalidien) is 'n kragtige antagonis van sowel histamien as asetielcholien, met 'n opvallende uitwerking op sel- en haarvatdeurdringbaarheid. Kalsiumlaktobionaat (Kalsium, Sandoz) verhoog die effek van *Sandosten,* en skakel newe-effekte geheel en al uit.

Efedrien verseker die vinnige dekongestie van die slymvlies in die neus.

Daar is bevind dat die gebruik van hierdie samestelling in die vorm van 'n neusspuitmiddel besonder doeltreffend vir die behandeling van neusslymvliesontsteking is.



Indikasies: Hooikoors; allergiese en vasomotoriese neusslymvliesontstekking.

Aanwending: Haal die doppie van die verstuiwer af, steek die tuit in die neus, en druk stadig maar stewig. Nadat u die verstuiwer toegelaat het om weer eens vol lug te word, word die proses in die ander neusgat herhaal. Een bestuiwing van elke neusgat is voldoende, maar die middel kan etlike kere per dag gebruik word.

Aanbieding: Plastiekverstuiwers wat 10 ml. van die oplossing bevat. Die verstuiwers word net gedeeltelik gevul om behoorlike verstuiwing te verseker.

Verspreiders: Alex. Lipworth Ltd., Posbus 4461, Johannesburg; Posbus 4838, Kaapstad; Posbus 1988, Durban; Posbus 3188, Port Elizabeth.

BUSCOPAN

HIOSSIEN-N-BUTIELBROMIED

Veel stelselmatige navorsingswerk is gedoen met die doel om 'n krampweermiddel wat goed deur pasiënte verdra sal word, te vind.

In die laboratorium van C. H. Boehringer Sohn is die probleem op 'n fundamenteel nuwe manier benader.

'n Reeks kwaternêre ammoniumsamestellings is sinteties van skopolamien geproduseer. Na uitvoerige kliniese ondersoek is *Buscopan* (hiossien-butielbromied) vir wêreld-verspreiding beskikbaar gestel. Sedert 1951 het ongeveer 200 referate oor die resultate van kliniese proefnemings met *Buscopan* in mediese tydskrifte dwarsdeur die wêreld verskyn.

Ten spyte van die groot aantal krampweermiddels wat vandag verkrygbaar is, het wêreldwye erkenning en aanvaarding *Buscopan* te beurt geval. In baie opsigte het dit die eienskappe van die ideale terapeutiese middel. *Dit beoefen sy terapeutiese effek uit sonder om onaangename of toksiese newe-effekte te veroorsaak.*

Dit werk gladdespier-krampe in die maagdermkanaal en in die vroulike geslagsorgane teë. *Buscopan* is in staat om gladdespierkrampe in die slukderm, die urienleiers, die urienblaas, die urienbuis, asook in die mond van die baarmoeder en in die uterosakrale bande te laat verslap sonder enige betekenisvolle newe-effekte op die speeksel- en sweetkliere, die hart of die sentrale senuweesstelsel.

Buscopan kan derhalwe vryelik voorgeskryf word ooreenkomstig die behoeftes van die individuele pasiënt—indien nodig in groot dosisse oor 'n lang tydperk. Dit kan sonder die minste aarseling aan kinders en aan pasiënte van alle ouderdomme gegee word.

Beskikbaarstelling: Tablette, bottels van 20; bottels van 100.

Ampulle, 6'e.

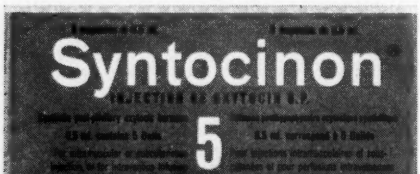
Mediese Navrae: Pfizer Laboratories (Pty.) Limited, Posbus 7324, Johannesburg.

SYNTOCINON

(SINTETIESE OKSITOSIEN)

Sandoz. Ltd. kondig die beskikbaarstelling aan van *Syntocinon* (sintetiese oksitosien), die eerste sintetiese polipeptied- (oktapeptied-) hormoon wat in die handel verkrygbaar is.

Beskrywing: Wat chemiese samestelling betref, stem *Syntocinon* presies ooreen met die oksitosienhormoon van die agterste harsingslymklier, maar in plaas daarvan dat dit van die agterste harsingslymkliere van diere verkry word, is dit volkome sinteties. Dit verseker die algehele afwesigheid van die vasopressorhormoon en van vreemde proteïne.



Farmakologiese en kliniese navorsingswerk het aangedui dat *Syntocinon* presies dieselfde oksitosieneffek as natuurlike oksitosien, B.P., het. *Syntocinon* is biologies gestandaardiseer.

Eienskappe: Syntocinon oefen 'n selektiewe effek op die gladde spierstelsel van die baarmoeder uit, veral teen die einde van swangerskap, gedurende bevalling en onmiddellik na verlossing. Dit bewerkstellig ritmiese sametrekkings van die baarmoeder, verhoog die frekwensie en omvang van die bestaande sametrekkings, en verbeter die tonus van die baarmoederspier. Omdat dit nie die bloeddruk affekteer nie, kan *Syntocinon* sonder gevaar vir toksemiese pasiënte met hoë bloeddruk gebruik word.

INDIKASIES EN DOSIS

	Binne-Aarse Ingieting	*Binne-Aarse Inspuiting*	*Binnespierse of Onderhuidse Inspuiting*
Induksie van bevalling aan die einde van swangerskap	1 I.E. in 100 ml. glukose-oplossing van 5% teen 8 tot 40 druppels per minuut, of meer, na gelang van die effek.	—	0·5 tot 2 I.E. wat al om die 30 tot 60 minute herhaal kan word.
Hipotoniese onaktiwiteit van die baarmoeder.			0·25 tot 1 I.E. wat soos benodig herhaal kan word
Bloeding na die geboorte.*	1 tot 2 I.E. per 100 ml. glukose oplossing van 5%. Die ingieting kan vinniger geskied as wat hierbo aangedui is.	5 tot 10 I.E.	5 tot 10 I.E.

*In hierdie gevalle het die ergotalkaloïede (Methergin, Gynergen, Neo-Gynergen; q.v.) 'n langduriger effek.

Aanbieding: Ampulle van 5 eenhede in 0·5 ml. Dosies van 6. Ampulle van 10 eenhede in 1 ml. Dosies van 6.

Verspreiders: Alex. Lipworth Ltd., Posbus 4461, Johannesburg; Posbus 4838, Kaapstad; Posbus 1988, Durban; Posbus 3188, Port Elizabeth.

VERWYSINGS

Bainbridge, M. N. *et al.* (1956): Brit. Med. J., **1**, 1133.

Francis, H. H. en Francis, W. J. A. (1956): Brit. Med. J., **1**, 1136.

CORRESPONDENCE

MANAGEMENT OF POLIOMELITIS

To the Editor: In reply to Dr. Klass' comment on the article by Mr. C. J. Kaplan, I would like to record that many old polio cases have come under my care after as long a period as 9 years following the acute stage. However, with up-to-date physiotherapy there has been a recovery of paralysed muscles.

Apparently in these cases the anterior horn cells have not been completely knocked out and some nerve fibres are still intact. These seem to need a stimulus to set them acting. I have found this stimulus through the use of exponential and rectangular currents available with the use of modern electronic valve machines. Such currents can painlessly stimulate the paralysed muscles without stimulating the adjacent normal muscles. With the addition of heat, massage, hydrotherapy, Kabat and other exercises, there has been a progressive recovery, which is often slow, and requires the assiduous efforts of both patient and therapist. Even then full power may not be regained.

Ronald Robins-Browne.
M.D., D.Phys.Med., L.M., M.R.C.S

8 Moray House,
Jeppe St., Johannesburg.